CORPORATE FINANCE ASAP

ANALYSIS AND DECISION MAKING TOOLS AND TECHNIQUES

JOHN COUSINS

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CORPORATE FINANCE ASAP

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INTRODUCTION

Finance is a broad topic that can be challenging to wrap your mind around. For clarity's sake, think of Finance of organized along economic lines of micro and macro. On the micro side we have business decisions and Corporate Finance. On the macro side we have financial markets, money and banking.

This book will focus on Corporate Finance. Corporate Finance covers how to analyze opportunities. It provides tools to make decisions like what projects to pursue and how to value those projects. This book provides a framework for how to make decisions about how, when, and where to invest money.

Corporate finance is concerned with making allocation decisions about limited resources. A business has human resources, technical resources, and access to money. It wants to put those resources to work to take advantage of opportunities to grow and make money. The task of management is to allocate and leverage the resources it controls.

Management must choose the most promising projects. That is how their performance gets measured. That is how they are rewarded. That is how they keep their jobs.

Managers and leaders want to make supportable rational decisions about what to do and how to do it. They also need to track the perfor-

mance of their decisions. And course correct when necessary. Corporate finance provides a set of tools for informing these decisions.

Corporate Finance skills interact with all the aspects of running a business. These tools and techniques are also helpful in our personal lives. We make decisions about buying or leasing, borrowing money, and making big purchases. Armed with this knowledge, make better decisions about spending, saving, and investing money.

In this book we will explore the time value of money. We will learn how to use Net Present Value and Internal Rate of Return.

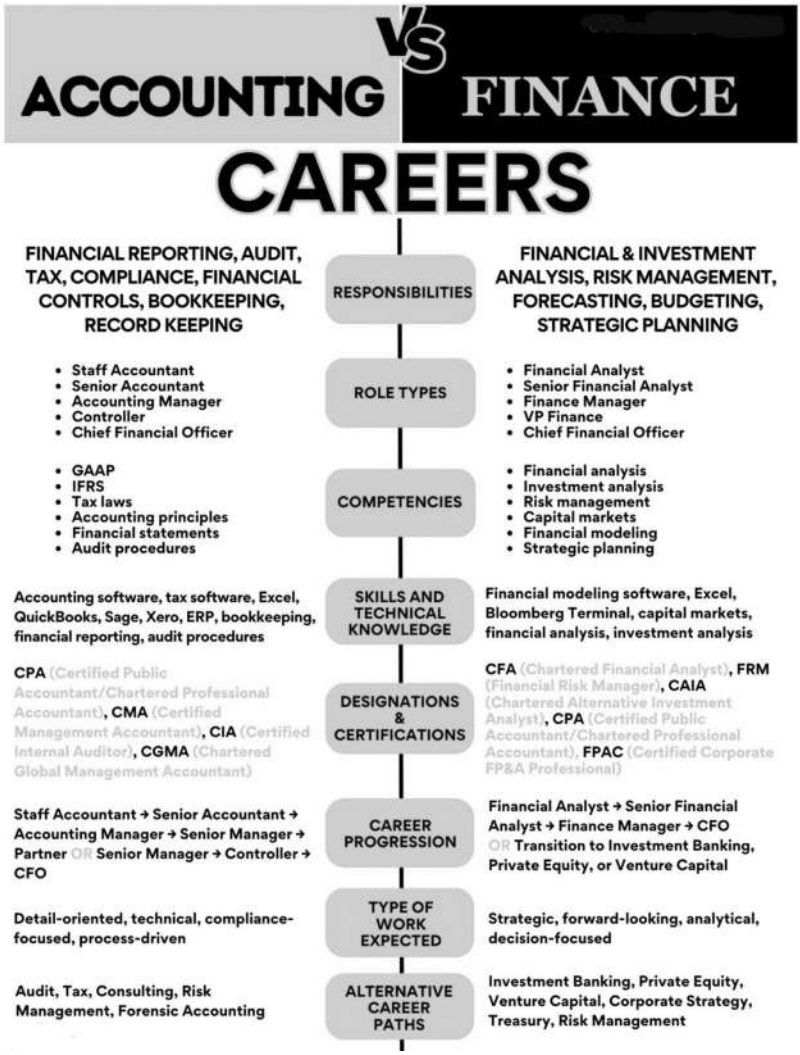
This book provides a framework for how financial professionals make decisions about how, when, and where to spend money.

We will examine the trade off between risk and return, and how to value income producing assets. Valuation of companies and assets can seem mysterious. Where do you even begin? How can you value a startup that doesn't even have any revenues yet? By the end of this book you will be able to answer those questions.

You will gain confidence in your knowledge and understanding of finance. The tools of corporate finance will help you as a manager or business owner. You will make smart decisions about the value of opportunities that come your way. You will know which ones to pursue.

Understanding corporate finance is essential for the professional manager. Numbers are the language of business. Take part in decisions with colleagues and upper management. You need command of this subject to climb any corporate ladder.

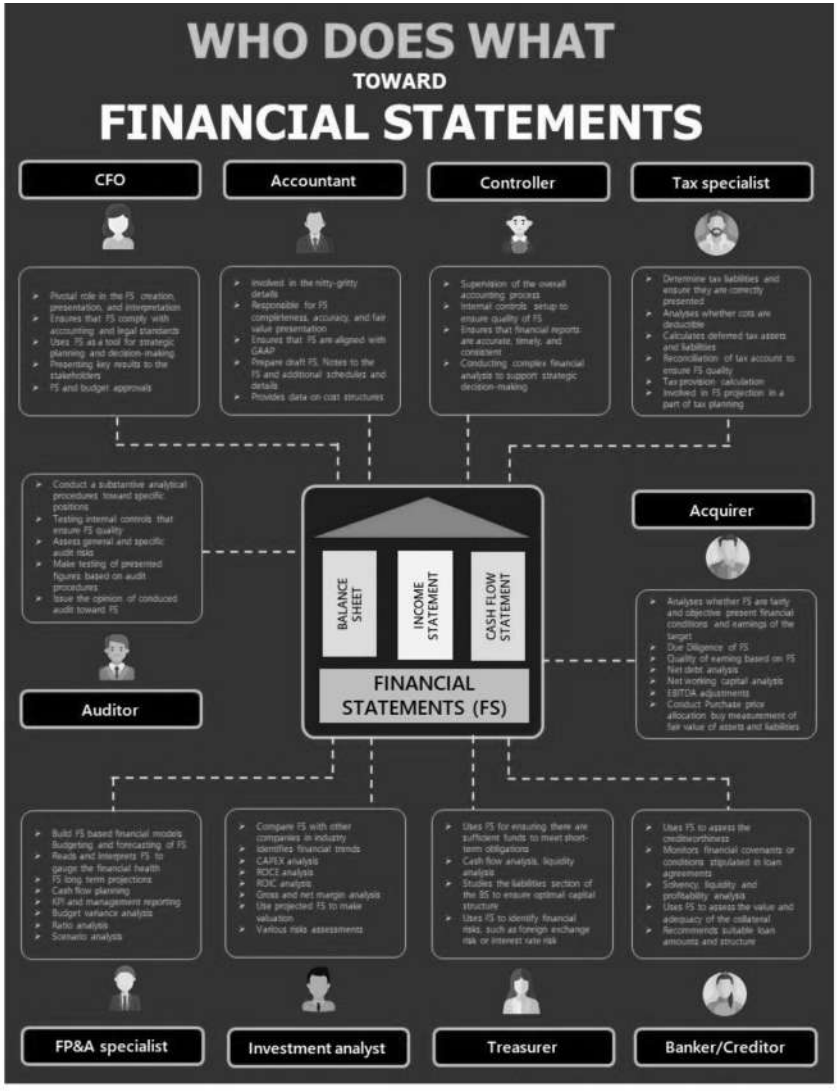
Let's begin by looking at financial statement analysis and ratios.


ACCOUNTING
VS
FINANCE
CAREERS
RESPONSIBILITIES
FINANCIAL REPORTING, AUDIT, TAX, COMPLIANCE, FINANCIAL CONTROLS, BOOKKEEPING, RECORD KEEPING
FINANCIAL & INVESTMENT ANALYSIS, RISK MANAGEMENT, FORECASTING, BUDGETING, STRATEGIC PLANNING
ROLE TYPES
Staff Accountant
Senior Accountant
Accounting Manager
Controller
Chief Financial Officer
Financial Analyst
Senior Financial Analyst
Finance Manager
VP Finance
Chief Financial Officer
COMPETENCIES
GAAP
IFRS
Tax laws
Accounting principles
Financial statements
Audit procedures
Financial analysis
Investment analysis
Risk management
Capital markets
Financial modeling
Strategic planning
SKILLS AND TECHNICAL KNOWLEDGE
Accounting software, tax software, Excel, QuickBooks, Sage, Xero, ERP, bookkeeping, financial reporting, audit procedures
Financial modeling software, Excel, Bloomberg Terminal, capital markets, financial analysis, investment analysis
DESIGNATIONS & CERTIFICATIONS
CPA (Certified Public Accountant/Chartered Professional Accountant), CMA (Certified Management Accountant), CIA (Certified Internal Auditor), CGMA (Chartered Global Management Accountant)
CFA (Chartered Financial Analyst), FRM (Financial Risk Manager), CAIA (Chartered Alternative Investment Analyst), CPA (Certified Public Accountant/Chartered Professional Accountant), FPAC (Certified Corporate FP&A Professional)
CAREER PROGRESSION
Staff Accountant → Senior Accountant → Accounting Manager → Senior Manager → Partner OR Senior Manager → Controller → CFO
Financial Analyst → Senior Financial Analyst → Finance Manager → CFO OR Transition to Investment Banking, Private Equity, or Venture Capital
TYPE OF WORK EXPECTED
Detail-oriented, technical, compliance-focused, process-driven
Strategic, forward-looking, analytical, decision-focused
ALTERNATIVE CAREER PATHS
Audit, Tax, Consulting, Risk Management, Forensic Accounting
Investment Banking, Private Equity, Venture Capital, Corporate Strategy, Treasury, Risk Management

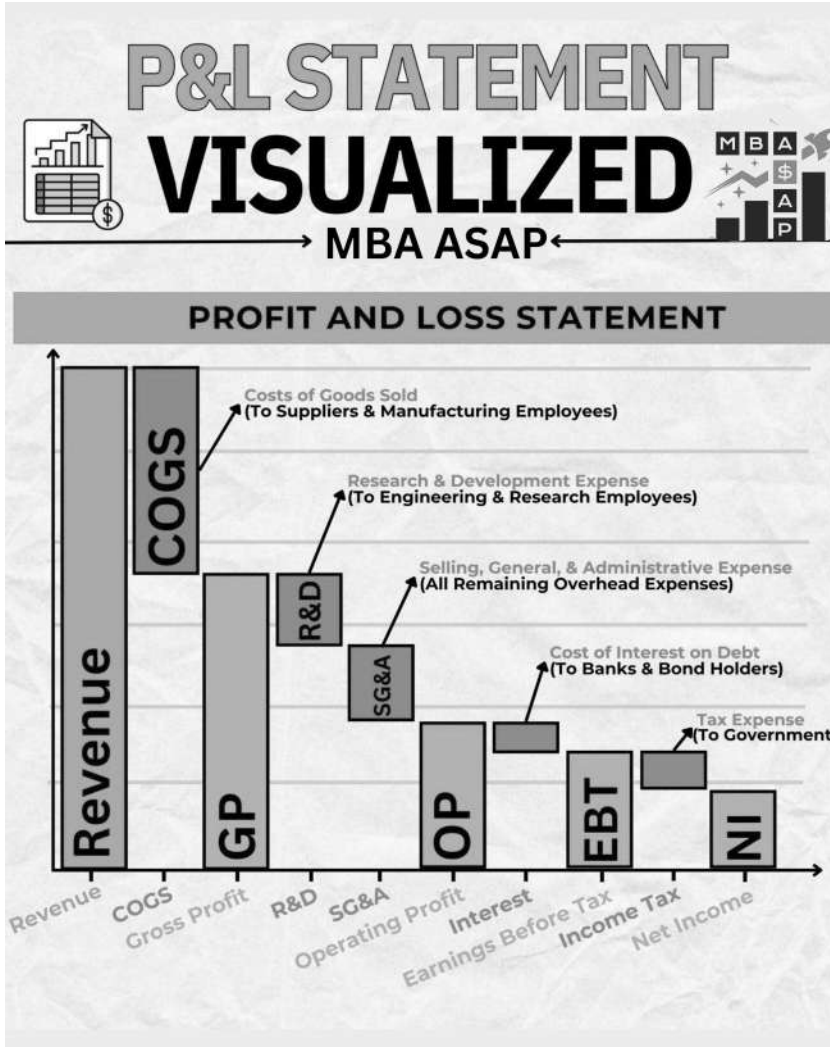

FINANCE CAREER PATHS
MBA ASAP
ACCOUNTING
Education
Bachelor's degree in Accounting, Finance
Certifications: CPA, CMA
Junior role
Financial statement preparation
Basic bookkeeping tasks
Form preparation assistance
Senior role
Review junior accountants' work
Ensure accounting standards compliance
Advanced accounting tasks
Management role
Supervise accounting department
Develop accounting policies
Manage financial internal controls
FP&A
Education
Bachelor's or Master's degree in Finance or BA
Certifications: FPAC
Junior role
Analyze financial data
Create financial models
Prepare financial performance reports
Senior role
Manages a budget area
Run performance initiatives with other departments
Present financial analyses to management
Management role
Manage financial planning & analysis function
Oversee budgeting
Lead performance strategic initiative across the firm
TAX
Education
Bachelor's degree in Accounting, Finance
Certifications: CPA, CTA
Junior role
Prepare and file tax returns
Conduct tax research
Identify tax-saving strategies
Senior role
Oversee tax associates' work
Provide tax planning services
Handle complex tax issues
Management role
Supervise tax department
Develop tax policies and strategies
Collaborate on tax-related matters

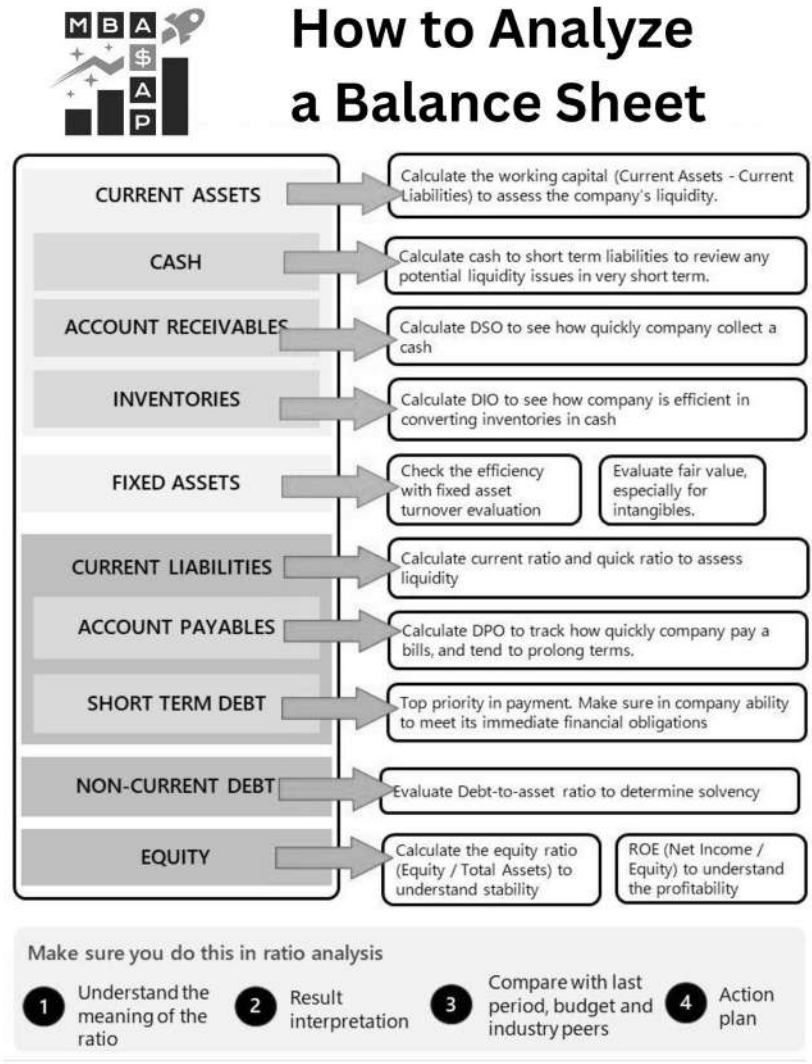
CHAPTER 1
THE BIG PICTURE OF FINANCIAL STATEMENTS

THE THREE FINANCIAL STATEMENTS, namely, the balance sheet, income statement, and cash flow statement, are interconnected, and the accounting numbers flow through them. They are the measure of a company's performance and health.



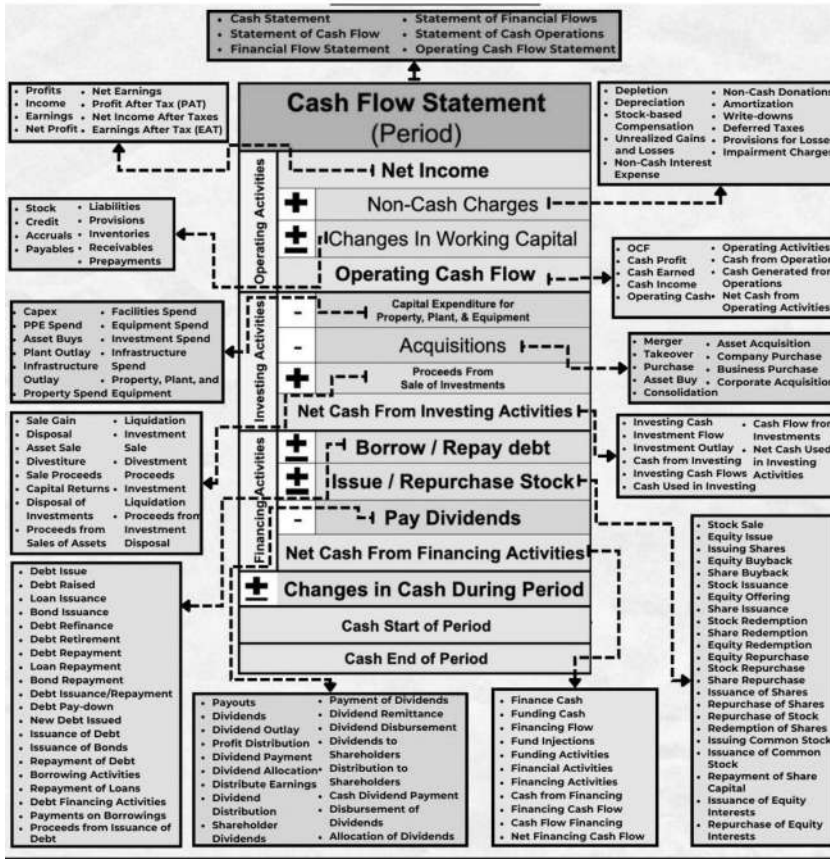
The interconnection starts with a Balance Sheet showing the financial position at the beginning of the period (usually a year); next, you have the Income Statement that shows the operations during the year, and then a balance Sheet at the end of the year.


P&L STATEMENT
VISUALIZED
MBA ASAP
PROFIT AND LOSS STATEMENT
Revenue
COGS
GP
R&D
SG&A
OP
EBT
NI
Costs of Goods Sold
(To Suppliers & Manufacturing Employees)
Research & Development Expense
(To Engineering & Research Employees)
Selling, General, & Administrative Expense
(All Remaining Overhead Expenses)
Cost of Interest on Debt
(To Banks & Bond Holders)
Tax Expense
(To Governments)
Revenue
COGS
Gross Profit
R&D
SG&A
Operating Profit
Interest
Earnings Before Tax
Income Tax
Net Income



The Cash Flow is necessary to reconcile the cash position starting from the Net Income number at the bottom of the Income Statement. The cash number calculated from the Cash Flow Statement is added to the cash reported on the beginning Balance Sheet. This number needs to match the actual money in the bank at the end of the period and is used as the Cash account balance at the top right (Asset column) of the end-of-year (EOY) Balance Sheet.

Cash Flow Statement Synonyms

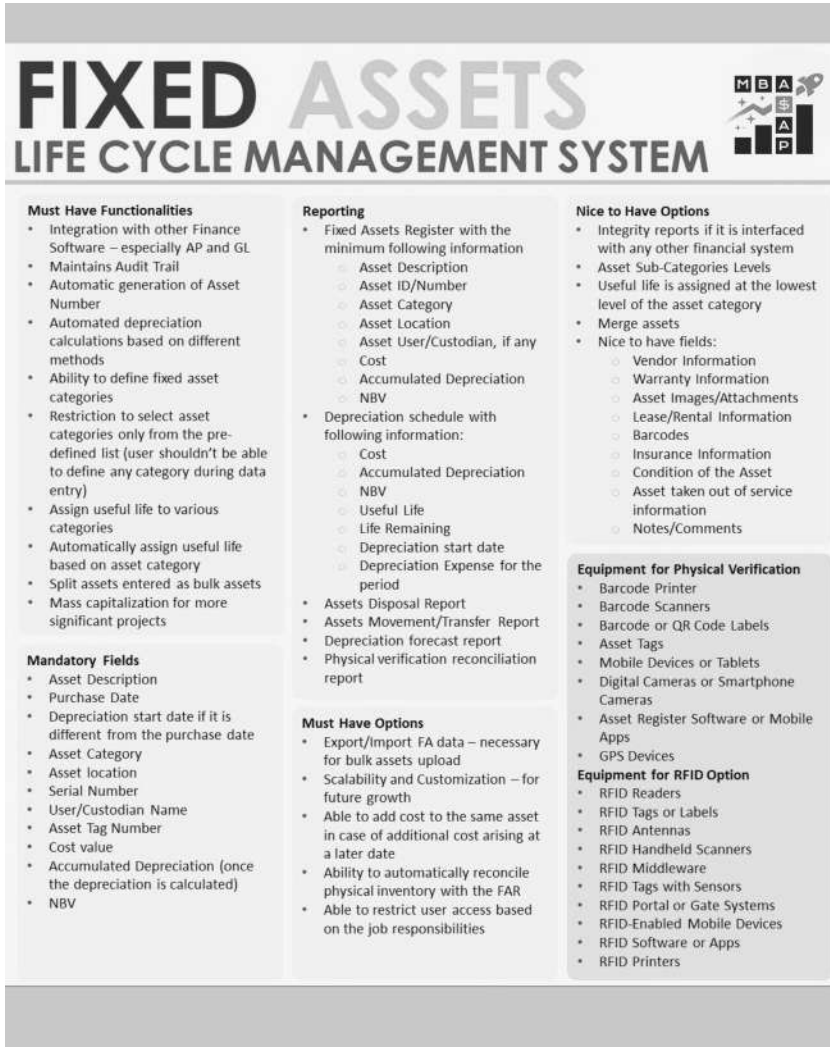


The Net Income number from the Income Statement is then added to the Retained Earnings number in the Equity section (lower left-hand side) of the end-of-year (EOY) Balance Sheet.

Changes in non-cash accounts like Accounts Receivable and Accounts Payable and Depreciation and Amortization will make up the difference between the Cash Flow number added on the right side of the Balance Sheet and the Net Income number added on the left-hand side.

. . .

When this is done correctly, all the numbers should reconcile. The Assets will equal the Liabilities and Equity (remember the Accounting Equation A = L + E) of the EOY Balance Sheet.



FINANCIAL STATEMENT INTERCONNECTIONS AND FLOW

Think of it as a system of two Balance Sheets acting as bookends for the Income Statement. And the Cash Flow Statement is used to recon-

cile the Net Income (or Loss) at the bottom of the Income Statement with the amount of cash in the bank.

This process accounts for every penny that has come in, gone through, and gone out of a company during the period.

Understanding these three financial statements and how they knit together will allow you to assess any company's financial health, viability, and prospects and help you make rational, fact-based investment decisions. This is how Warren Buffett does it.

Understanding financial statements is the basis of Financial Literacy and Capitalism. Understanding this big conceptual accounting picture will provide a context to keep you from getting lost in the details.

If you want a more detailed look at financial statements get the previous book in this series: Financial Statements ASAP! Reading and Understanding Financial Statements.

HOW TO ANALYZE PROFITABILITY

Income Statement	2018	2019	2020	2021	2022
Revenue					
Segment A	123,423	210,945	560,934	1,902,345	3,209,349
Segment B	876,676	1,102,254	1,329,613	1,781,980	2,288,972
Total Revenue	1,000,099	1,313,199	1,890,547	3,684,325	5,498,321
		31%	44%	95%	49%
Cost of Sales					
Segment A					
Labor	55,475	108,596	114,635	294,246	505,891
Raw Materials	92,459	180,993	191,058	490,410	843,151
	147,934	289,589	305,693	784,656	1,349,042
Segment B					
Labor	118,348	189,094	198,532	627,725	1,079,233
Raw Materials	103,554	202,712	213,985	549,259	944,329
	221,902	391,806	412,517	1,176,984	2,023,562
Total Cost of Sales	369,836	681,395	718,210	1,961,640	3,372,604
	37%	52%	38%	53%	61%
Gross Profit	630,263	631,804	1,172,337	1,722,685	2,125,717
Gross Profit Margin (1)	63%	48%	62%	47%	39%
Operating Expenses	468,598	866,185	1,539,933	2,326,177	2,904,283
	47%	66%	81%	63%	53%
Operating Profit	161,665	(234,381)	(367,596)	(603,492)	(778,566)
Operating Profit Margin (2)	16%	-18%	-19%	-16%	-14%
Other Income/(Expense)	31,530	47,869	196,951	198,901	(63,349)
Income tax expense/recovery	24,250	(35,157)	(55,139)	(90,524)	(116,785)
Net Profit (3)	168,945	(151,355)	(115,505)	(314,067)	(725,130)
Net Profit Margin	17%	-12%	-6%	-9%	-13%

Gross Profit Margin: (Gross Profit / Revenue) x 100

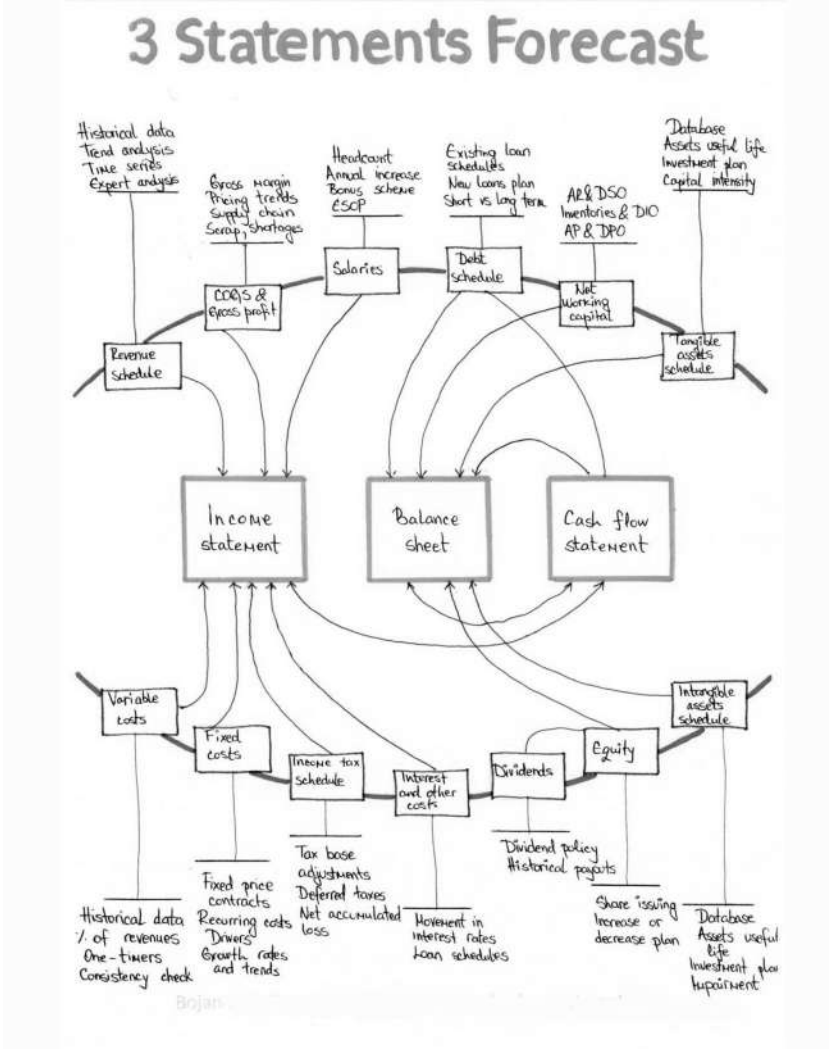
This tells you how efficiently raw materials and labor are being used to generate revenue.
Drops could be due to increased costs or ineffective pricing.

Operating Profit Margin: (Operating Income / Revenue) x 100

This shows how much of each dollar of revenues is left after paying for COGS (cost of goods sold) and OPEX (operating expenses).
If it's dropping, it should signal lack of operating flexibility and trigger a cost review

Net Profit Margin: (Net Income / Revenue) x 100

This is what's left after all expenses and taxes are paid.
If it's dropping, but other margins are fine, optimize tax and debt costs.
If it's dropping alongside one of your other margins, the business model and capital structure may need an overhaul.


3 Statements Forecast
Historical data
Trend analysis
Time series
Expert analysis
Gross margin
Pricing trends
Supply chain
Scrap, shortages
Headcount
Annual increase
Bonus scheme
ESOP
Existing loan schedules
New loans plan
Short vs long term
AR & DSO
Inventories & DIO
AP & DPO
Database
Assets useful life
Investment plan
Capital intensity
Salaries
Debt schedule
Net working capital
COGS & Gross profit
Revenue schedule
Tangible assets schedule
Income statement
Balance sheet
Cash flow statement
Variable costs
Fixed costs
Income tax schedule
Interest and other costs
Dividends
Equity
Intangible assets schedule
Historical data
% of revenues
One-timers
Consistency check
Fixed price contracts
Recurring costs
Drivers
Growth rates and trends
Tax base adjustments
Deferred taxes
Net accumulated loss
Movement in interest rates
loan schedules
Dividend policy
Historical payouts
Share issuing
Increase or decrease plan
Database
Assets useful life
Investment plan
Impairment

HOW TO ANALYZE A CASH FLOW STATEMENT

What is a Cash Flow Statement?

- A cash flow statement shows you how much cash goes in and out a company over a certain period
- The purpose of this statement is to track how much cash is moving through a business
- You want to invest in companies that generate cash and manage their cash position well

Structure of a Cash Flow Statement:

- Every cash flow statement consists of 3 parts:
  1. Cash Flow from Operating Activities
  2. Cash Flow from Investing Activities
  3. Cash Flow from Financing Activities

Cash Flow from Operating Activities:

- This section shows all cash the company generated from its normal business activities
- It shows you all the cash a company earned from selling its normal products and/or services
- The Cash Flow from Operating Activities is comparable to net income, but it filters out a few income and expense posts that didn't cause actual cash to enter or exit the company
- fx Cash Flow from Operating Activities = net income + non-cash charges +/- changes in working capital

Cash Flow from Investing Activities:

- The Cash Flow from Investing Activities gives you an overview about the company's investment related income and expenditures
- The Cash Flow from Investing Activities consists of 3 major parts:
  1. Capital expenditures (CAPEX)
  2. Mergers & Acquisitions
  3. Marketable securities
- fx Cash Flow from Investing Activities = Sale of marketable securities + divestments - CAPEX - Mergers & Acquisitions - purchase of marketable securities

Cash Flow from Financing Activities:

- Measures the cash movements between a company and its owners (shareholders) and its debtors (bondholders)
- This section gives you an insight about how the company is financing its business activities
- fx Cash Flow from Financing Activities = Debt issuance + issuance of new stocks - dividends - debt repayments - share buybacks

Changes in cash balance:

- Finally, you can calculate the total changes in the cash balance
- fx Cash at the end of the year = Cash at the beginning of the year + CF from Operating Activities + CF from Investing Activities + CF from Financing Activities

WHO USES FINANCIAL STATEMENTS?

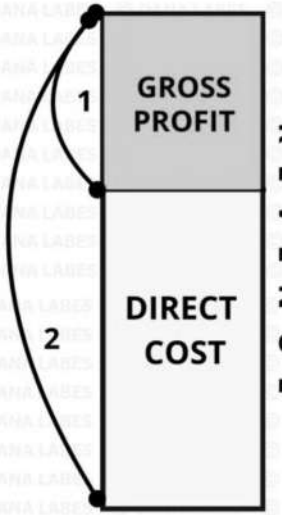
MBA ASAP

USERS	PURPOSE OF USE	CONCERN AREAS
Shareholders/ Investors	To assess the performance of the company and make decisions regarding buying, holding, or selling shares.	Earnings per share (EPS) Dividend payment history Return on equity (ROE) Growth trends and potential
Analysts	To provide recommendations or insights to investors and other stakeholders about the company's financial performance.	Underlying trends in financial statements Projections and future estimates Comparative analysis with industry peers
Creditors/Lenders	To evaluate the creditworthiness of the company and its ability to repay loans or provide ongoing credit.	Liquidity ratios (e.g., current ratio) Solvency ratios (e.g., debt-to-equity ratio) Cash flow from operating activities
Employees & Labor	To understand the company's profitability and stability, which can affect job security, wages, and benefits.	Profitability trends Company's expansion and hiring plans Employee benefits and compensation disclosures
Management	To make informed decisions about the company's operations, strategy, and future direction.	Segment-wise profitability Key performance indicators Budget vs actual performance
Regulators & Government	To ensure compliance with financial reporting standards and tax obligations.	Tax liabilities and payments Compliance with financial regulations Any contingent liabilities or off-balance-sheet financing
Competitors	To benchmark and compare their own performance and strategy against the company.	Profit margins Market share data Strategic initiatives disclosed

Margin & Markup

MARGIN SHOWS HOW MUCH OF YOUR PRODUCT SALES PRICE YOU KEPT

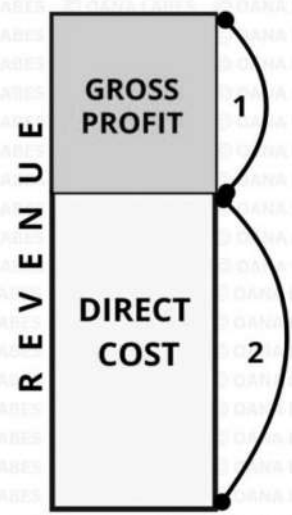
$$\text{MARGIN \%} = \frac{\text{(REVENUE - DIRECT COST)}}{\text{REVENUE}}$$



MARGIN = MARKUP/ (1+MARKUP)

MARKUP SHOWS HOW MUCH OVER COST YOU'VE SOLD YOUR PRODUCT FOR

$$\text{MARKUP \%} = \frac{\text{(REVENUE - DIRECT COST)}}{\text{DIRECT COST}}$$



MARKUP = MARGIN / (1-MARGIN)

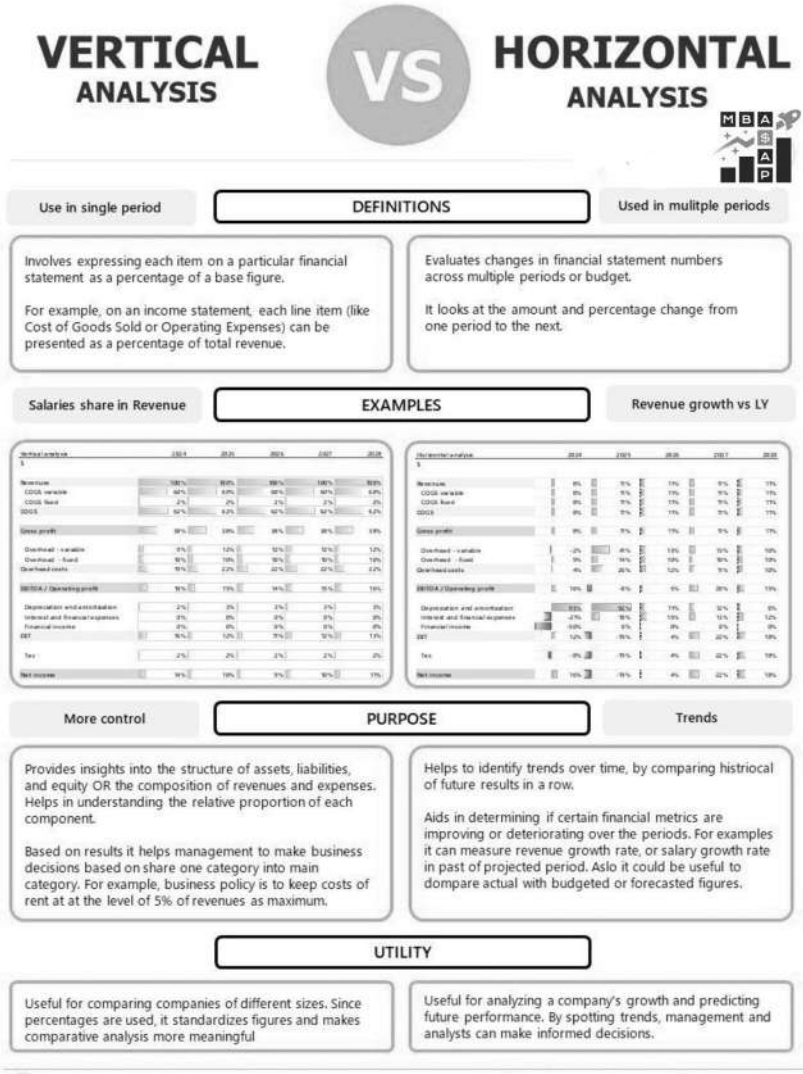
CHAPTER 2
RATIO ANALYSIS

THERE ARE ESSENTIALLY two basic techniques that are used in Corporate Finance. One is the ratio analysis of financial statements and the other is calculating the present value of future cash flows. Bankers, investors, financiers, CFOs and entrepreneurs use these tools and techniques to value assets and make investment decisions.

We can think of these two basic techniques like driving a car. Ratio analysis use the accounting data provided in financial statements. Financial statements are summations of prior activities. So they are like looking in a rear view mirror.

Lets look at using financial ratios as a capital budgeting tool. There are lots of different accounting ratios that get used inside of a firm. In fact, a lot of times the same accounting ratio gets called different things at different firms.

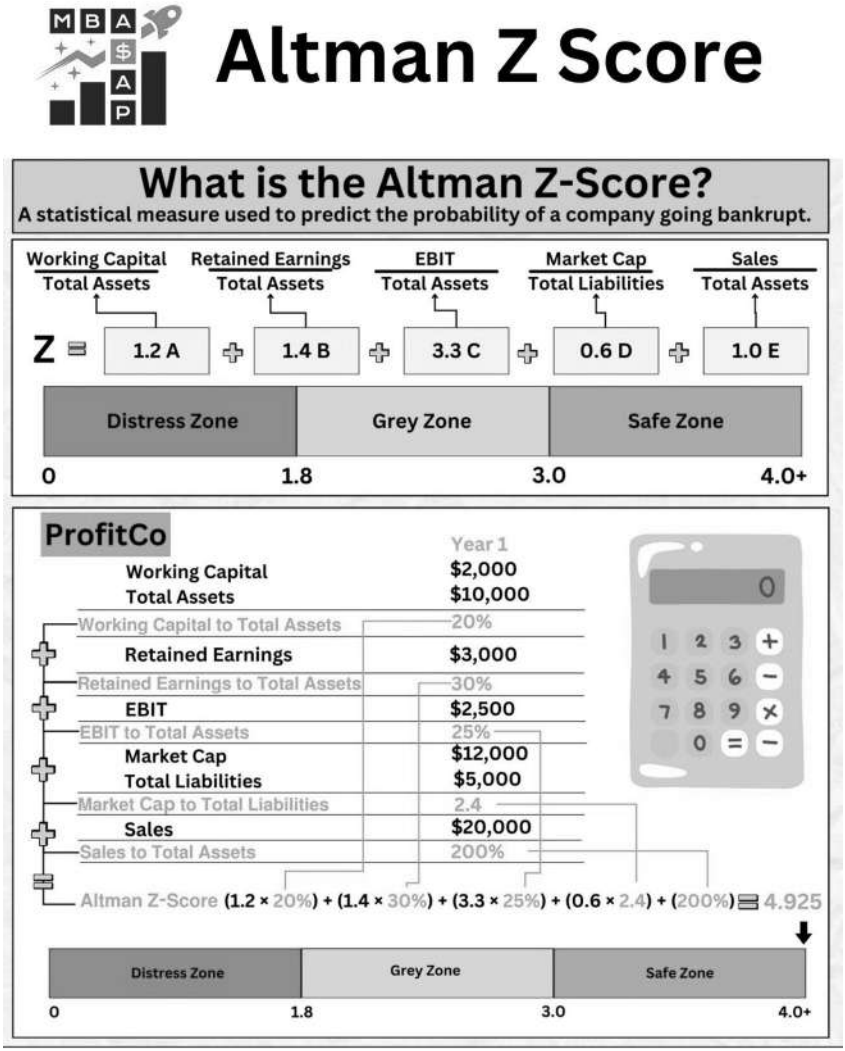
By ratio analysis I mean taking two numbers from financial statements and dividing one by the other. What we are doing is taking two pieces of accounting data, put one over the other, and this forms a ratio. We are taking two pieces of data and forming a performance metric. Ratios are usually presented as a percentage or a number depending on whether the usual case is bigger or less than one.



Ratios allow us to compare different companies or a company over time. Ratios are great tools to do this comparison because they allow us to "normalize" the numbers. A ratio eliminates any size differences and allows for pure comparison so you can compare apples to apples.

For this reason, ratio analysis is the basis for the stock market investment strategy of value investing. Value investing is the discipline

of examining and comparing companies based on their relative value and determining whether they are a bargain or expensive.



Financial ratios are derived from accounting information and rely on an understanding of financial statements.

There are three basic financial statements:

Balance Sheet

Income Statement

Cash Flow Statement

They are interconnected and financial data and information flows from one financial statement through the others.

Warren Buffet's Financial Statement Investment Criteria

	METRIC	EQUATION	THRESHOLD
INCOME STATEMENT	Gross Margin	Gross Profit / Revenue	>40%
	SG&A Margin	SG&A / Gross Profit	<30%
	R&D Margin	R&D / Gross Profit	<30%
	Depreciation Margin	Depreciation / Gross Profit	<10%
	Interest Margin	Interest Expense / Operating Income	<15%
	Tax Margin	Taxes / Pre-Tax Income	Corporate Tax Rate
	Net Income Margin	Net Income / Revenue	>20%
	EPS Growth	Year 2 EPS / Year 1 EPS	Positive & Growing
BALANCE SHEET	Cash & Debt	Cash > Debt	Cash > Debt
	Adjusted Debt to Equity	Total Liabilities / Shareholder Equity + Treasury Stock	Below 0.80
	Preferred Stock	NONE	NONE
	Retained Earnings	Year 2 Retained Earnings / Year 1 Retained Earnings	Consistent Growth
	Treasury Stock	Treasury Stock > 1	Exists
CASH FLOW STATEMENT	Capex Margin	Capex / Net income	<25%

Current financial statements represent a picture of where the company is today. It's a picture of how the company has performed in the most recent reporting period. Financial statements are how the present is connected to the past in business.

If you need a primer or refresher on understanding financial statements check out my ***Financial Statements ASAP*** book on the subject.

P/E RATIO

A particularly common valuation of companies done by ratio analysis is based on multiples of Earnings. The Price/Earnings ratio, or P/E for short, is a way companies are compared based on their stock price relative to their earnings. The earnings number is the bottom line of the Income Statement. Earnings are also referred to as Net Income or Profit.

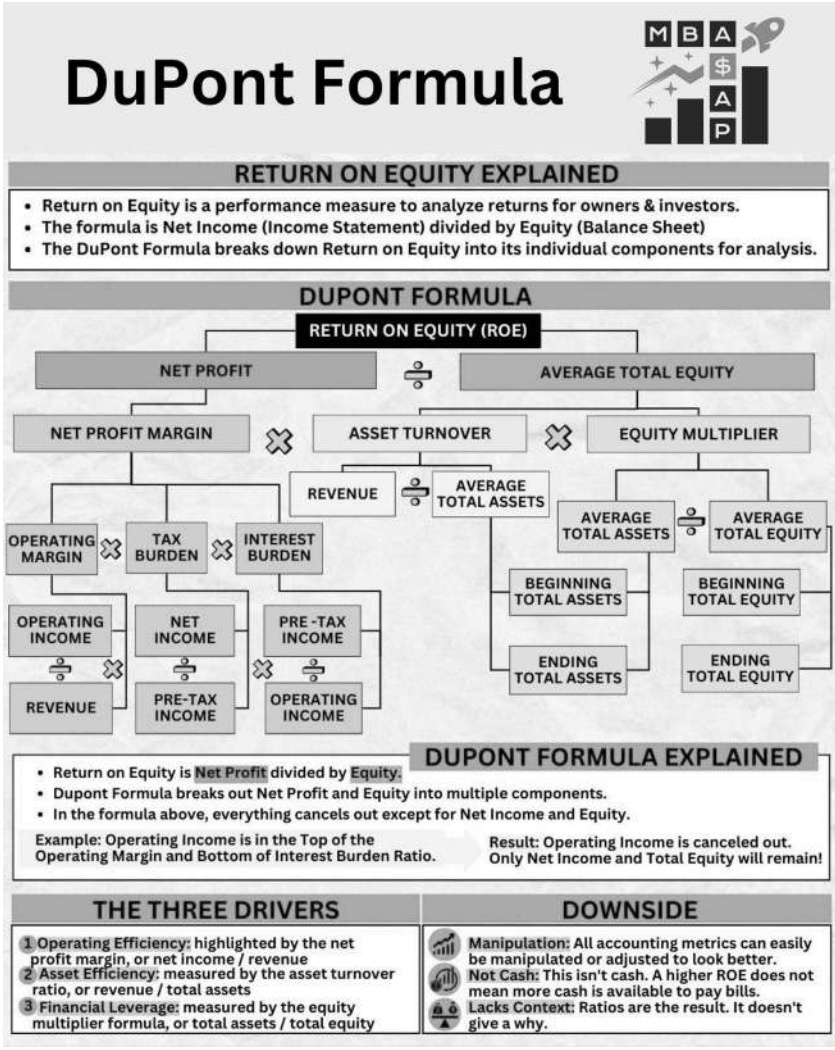
This ratio works well for comparing public companies that report these numbers. This technique can also be used to value a private company by comparing its earnings and valuation range to an average of public reporting companies in similar industry sectors and markets.

ROE AND ROA

Other common ratios based on the Balance Sheet are Return on Equity (ROE) and Return on Assets (ROA). A company can basically be thought of as a bunch of income producing assets. How much income they produce relative to how much they cost to acquire is a measure of how well they are performing.

Assets are bought using two types of funds, Equity, which is money investors put in, and Debt, which is borrowed from a bank or other lender. The Debt-to-Equity Ratio measures how much a company is borrowing.

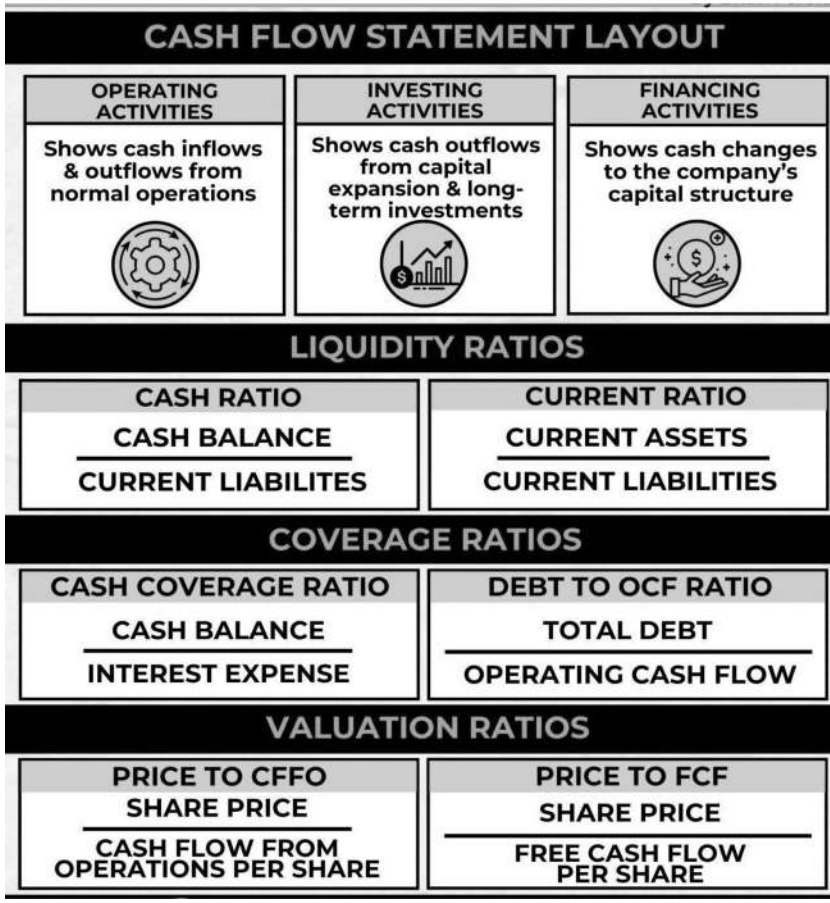
We can use ROE and ROA to analyze the performance of the Assets of a company. Here we take the money generated by the income producing assets and divide it by Equity for ROE or total assets for ROA.

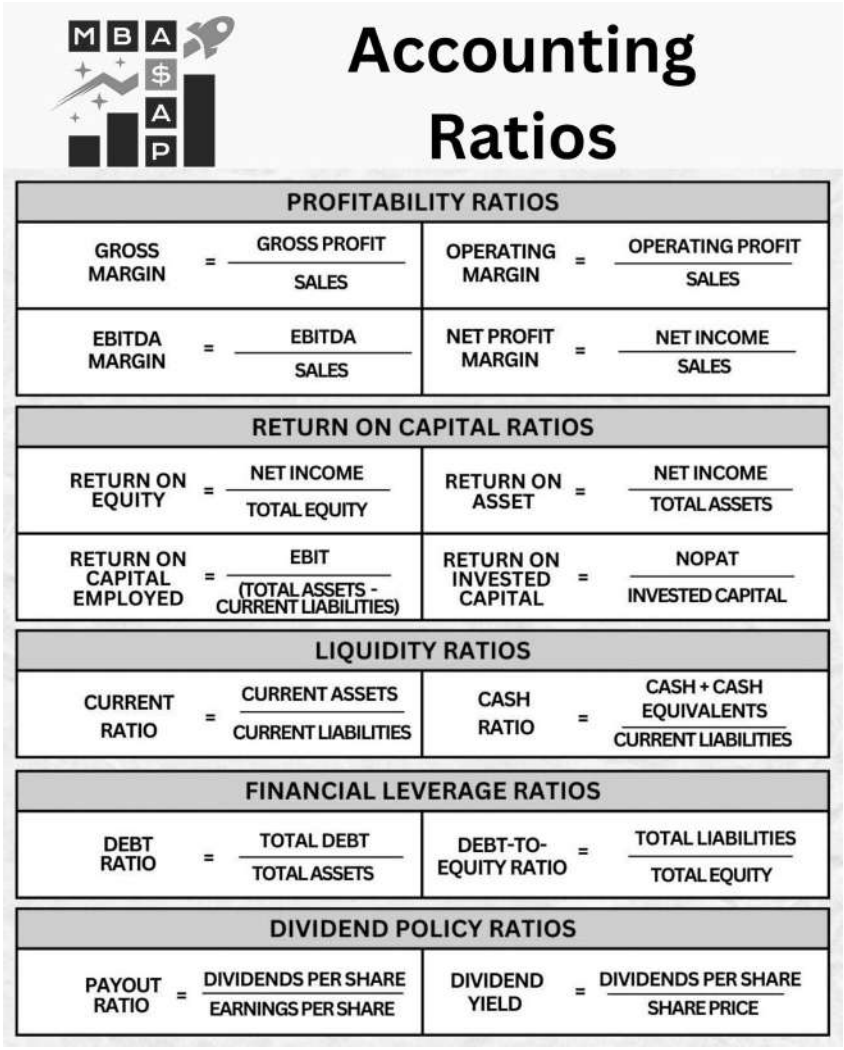


Ratio analysis is a powerful tool for investing in the stock market. If you like the idea of being a player in stock market and making good investments, check out The Intelligent Investor by Benjamin Graham. It is the bible of value investing and it's the way Warren Buffett and other successful investors do it.

A financial ratio eliminates any size differences and allows for pure comparison so you can compare apples to apples.

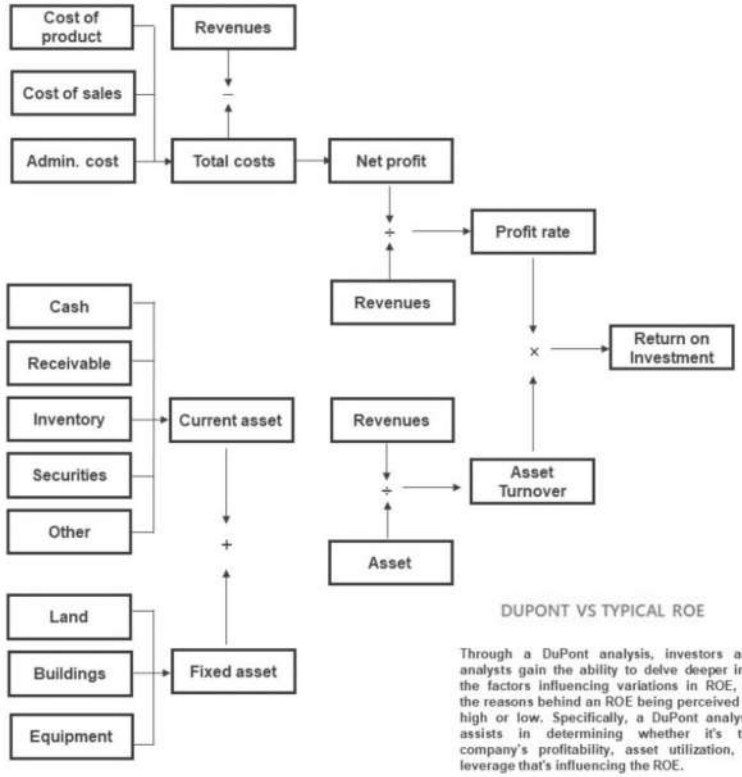
6 Cash Flow Ratios




MBA
$
AP
Accounting Ratios
PROFITABILITY RATIOS
GROSS MARGIN = GROSS PROFIT / SALES
OPERATING MARGIN = OPERATING PROFIT / SALES
EBITDA MARGIN = EBITDA / SALES
NET PROFIT MARGIN = NET INCOME / SALES
RETURN ON CAPITAL RATIOS
RETURN ON EQUITY = NET INCOME / TOTAL EQUITY
RETURN ON ASSET = NET INCOME / TOTAL ASSETS
RETURN ON CAPITAL EMPLOYED = EBIT / (TOTAL ASSETS - CURRENT LIABILITIES)
RETURN ON INVESTED CAPITAL = NOPAT / INVESTED CAPITAL
LIQUIDITY RATIOS
CURRENT RATIO = CURRENT ASSETS / CURRENT LIABILITIES
CASH RATIO = CASH + CASH EQUIVALENTS / CURRENT LIABILITIES
FINANCIAL LEVERAGE RATIOS
DEBT RATIO = TOTAL DEBT / TOTAL ASSETS
DEBT-TO-EQUITY RATIO = TOTAL LIABILITIES / TOTAL EQUITY
DIVIDEND POLICY RATIOS
PAYOUT RATIO = DIVIDENDS PER SHARE / EARNINGS PER SHARE
DIVIDEND YIELD = DIVIDENDS PER SHARE / SHARE PRICE

SIMPLIFIED
DU PONT ANALYSIS

DuPont analysis serves as an effective method for breaking down the various factors contributing to return on equity. This detailed dissection of ROE enables investors to concentrate on individual aspects of financial performance, thereby pinpointing specific areas of strength and weakness.



DUPONT VS TYPICAL ROE

Through a DuPont analysis, investors and analysts gain the ability to delve deeper into the factors influencing variations in ROE, or the reasons behind an ROE being perceived as high or low. Specifically, a DuPont analysis assists in determining whether it's the company's profitability, asset utilization, or leverage that's influencing the ROE.

COCA COLA VS PEPSI CO

FINANCIAL ANALYSIS

BALANCE SHEET

Balance sheet $ mio	Coca Cola	Pepsi	Difference
Cash	11,631	5,348	(6,283)
Account Receivable	3,487	10,163	6,676
Inventories	4,233	5,222	989
Other current assets	3,240	806	(2,434)
Current assets	**22,591**	**21,539**	**(1,052)**
Intangible assets	41,566	37,046	(4,520)
Tangible assets	9,641	24,291	14,650
Other investments and assets	18,765	9,311	(9,454)
Non-current assets	**70,172**	**70,648**	**476**
Total assets	**92,763**	**92,187**	**(576)**
Trade payables	15,865	20,852	4,987
Financial liabilities	2,772	3,141	369
Other liabilities	1,087	2,792	1,705
Current liabilities	**19,724**	**26,785**	**7,061**
Long term financial debt	36,377	35,657	(720)
Other long term liabilities	10,836	12,472	1,636
Long term fin. liabilities	**47,213**	**48,129**	**916**
Equity	**25,826**	**17,273**	**(8,553)**
Total Equity and liabilities	**92,763**	**92,187**	**(576)**

PROFITABILITY

Profitability ratios	Coca Cola	Pepsi	Diff
Gross profit margin	59.1%	53.9%	5%
EBITDA margin	35%	16%	18%
Net profit rate	24%	9%	15%
ROE	42%	48%	-6%
ROCE	15%	13%	2%
ROA	12%	9%	3%
Revenue per employee	546	291	255
Profit per employee	131	26	104
EBITDA per employee	189	47	142
Free cash flow rate	23%	8%	15%

- Coca Cola is more profitable especially looking into net profitability which implies better expenditure utilization.
- Free cash flow rate is significantly better at Coca Cola that could be sign of better cash management.

LIQUIDITY

Liquidity	Coca Cola	Pepsi	Difference
Net working capital	(5,992)	(7,453)	1,461
Curr. assets - Curr. liabilities	2,867	(5,246)	8,113
Current ratio	1.15	0.80	0.3
Cash ratio	0.59	0.20	0.4
Quick ratio	0.77	0.58	0.2
Working capital ratio	3%	-24%	27%

- Both companies recorded negative net working capital. They are significantly financed by account payables.
- Current ratio at Pepsi is less than 1 that is not good sign.

INCOME STATEMENT

Revenue	**45,030**	**91,617**	**46,587**
COGS	**18,399**	**42,204**	**23,805**
Gross profit	**26,631**	**49,413**	**22,782**
			0
Overhead - variable	7,424	33,288	25,864
Overhead - fixed	5,149	0	(5,149)
Overhead costs	**12,573**	**33,288**	**20,715**
			0
Other	**(1,494)**	**1,423**	**2,917**
EBITDA / Operating profit	**15,552**	**14,702**	**(850)**
Depreciation and amortization	1,547	3,437	1,490
EBIT	**13,605**	**11,265**	**(2,340)**
Interest and financial expenses	1,418	875	(543)
Financial income	783		(783)
EBT	**12,970**	**10,390**	**(2,580)**
			0
Tax	2,198	2,100	(98)
			0
Net income	**10,772**	**8,290**	**(2,482)**

EFFICIENCY

Efficiency	Coca Cola	Pepsi	Diff
DSO	28	40	(12.2)
DIO	84	45	38.8
DPO	315	180	134.4
Cash conversion	(202)	(95)	(107.8)
Asset turnover	0.5	0.99	(0.5)
Fixed asset turnover	0.6	1.3	(0.7)
EBITDA TO interest	11	17	(5.8)
Opex per employee	152	106	46.7

- Pepsi is better is inventory efficiency
- Both companies have high DPO, either they have outstandingly good payment terms with suppliers or they have overdue payables. Should be checked.

STRUCTURE

Structure	Coca Cola	Pepsi	Diff
Total COGS in Revenue	41%	46%	5%
COGS variable in revenue	41%	46%	5%
Overhead in revenue	28%	36%	8%
Interest expense in loans	3%	2%	-1%
Equity ratio	28%	19%	-9%
Debt ratio	72%	81%	9%
Fixed assets in total assets	76%	77%	17%

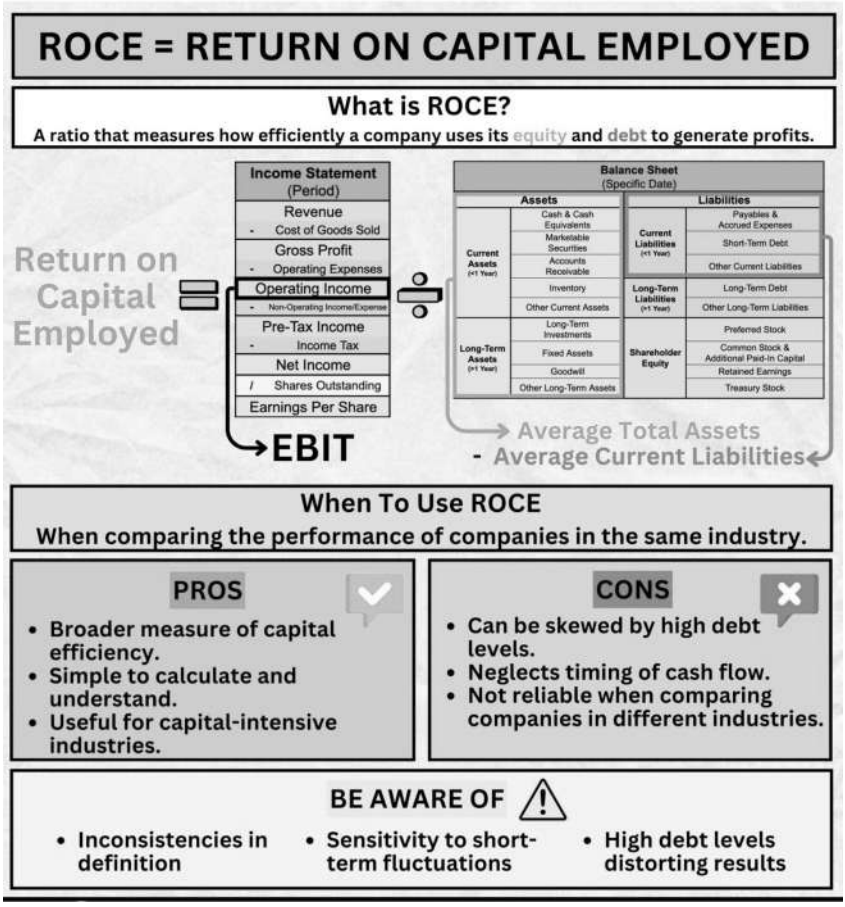
- Thanks to Goodwill, intangible assets shares almost 50% in total assets in both companies. This should be explored and tested on impairment.

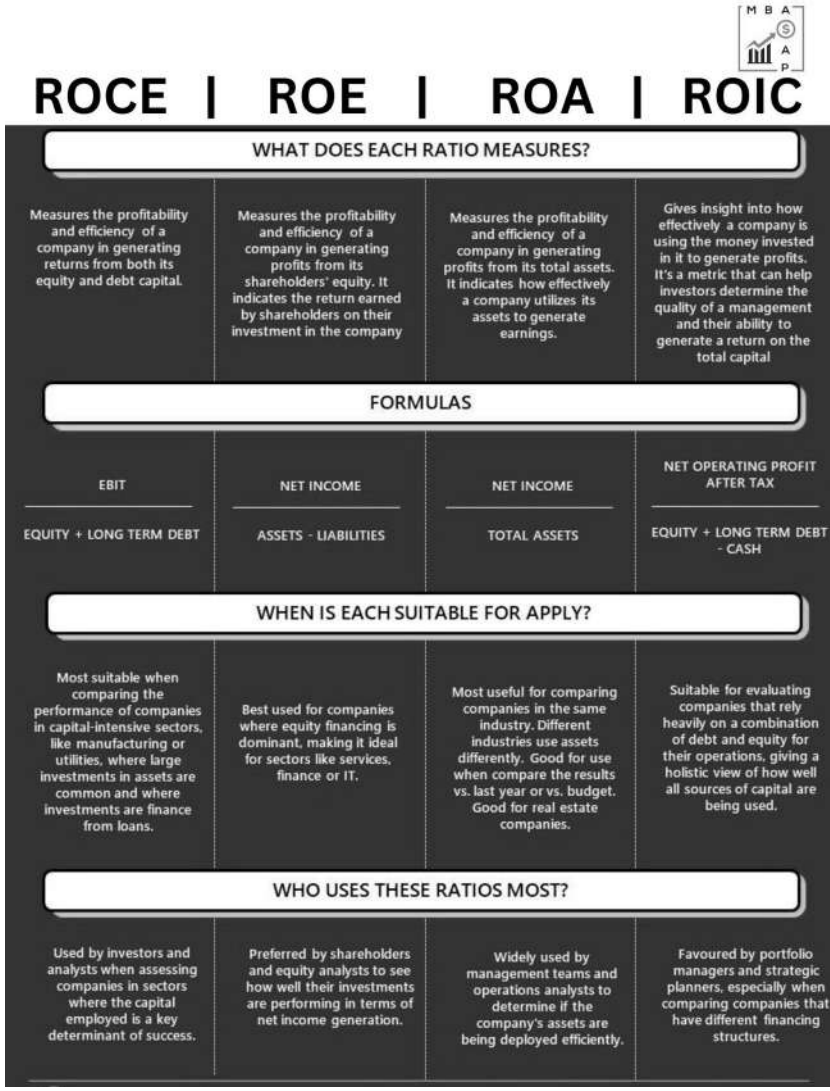
QUESTIONS TO ASK

- What ware changes in rations comparing last period
- What are variance from budget
- Is there a balance between profitability and liquidity?
- Why net working capital is negative?
- Why cash ratio is high?
- Is high ROE is sustainable?
- How has the operational efficiency changed over time?
- Why current ratio is less than 1
- Why revenue per employee is much lower than Coca Cola
- How has the operational efficiency changed over time?
- Why current ratio is less than 1
- Why revenue per employee is much lower than Coca Cola


WORKING CAPITAL
VS
INVESTED CAPITAL
Operational orientation / short term
Strategic orientation / long term
DEFINITION
The difference between a company's current assets (short-term resources) and current liabilities (short-term obligations). It measures a company's liquidity and ability to meet its day-to-day operational needs. Provides a buffer against unexpected cash flow disruptions. involves optimizing current assets and liabilities to improve liquidity
The total amount of money invested in a company or project. This can include equity from shareholders, debt from lenders, and retained earnings. It represents the total capital employed for generating returns . Provides a buffer against unexpected cash flow disruptions. used in metrics like return on invested capital (ROIC) to evaluate profitability and efficiency.
CALCULATION
1. Working Capital = Current Assets – Current Liabilities
2. Working Capital = Current Assets (less cash) – Current Liabilities (less debt)
3. (Net) WC = Accounts Receivable (AR) + Inventory (I) – Accounts Payable (AP)
1. Operational approach : Net Working Capital + PPE + Goodwill + Intangibles
2. Financing approach: Total debt and leases + Total equity and equity equivalents
FORECASTING
1. Make best estimate of Revenues and COGS
2. Based on historical data on AP, i and AR balance, calculate historical DSO, DIO and DPO.
3. Make best estimate of these indicators as assumptions for forecast relevant WC categories.
4. Or simply build 3 statement model and calculate WC
1. Project future equity (including retained earnings) and debt levels based on strategic plans and financing decisions.
2. Use current debt schedule & make planed debt schedules to make full debt forecast debt. Make CAPEX and NWC schedules.
3. Or simply build 3 statement model and calculate IC
RATIOS
Working capital Turnover
Working capital / Average assets
Measures the relationship between a company's net working capital and its total assets.
WC share in sales
Working capital / Sales
Measures how efficiently a company uses its working capital to generate sales
Return on invested capital (ROIC)
ROIC = EBIT x (1- tax) / Invested capital
Gives insight into how effectively a company is using the money invested in it to generate profits. It's a metric that can help investors determine the quality of a management and their ability to generate a return on the total capital
HOW TO IMPROVE
1. Improve inventory turnover to reduce excess stock.
2. Implement efficient collection strategies and possibly renegotiate payment terms with customers.
3. Optimize payment terms with suppliers without damaging relationships.
1. Optimize Capital Structure: Find the right balance between debt and equity to minimize the cost of capital and maximize value.
2. Investment Decisions: Make strategic decisions about where to invest capital for the best returns.

ROCE


ROCE = RETURN ON CAPITAL EMPLOYED
What is ROCE?
A ratio that measures how efficiently a company uses its equity and debt to generate profits.
Return on Capital Employed
Income Statement (Period)
Revenue
- Cost of Goods Sold
Gross Profit
- Operating Expenses
Operating Income
- Non-Operating Income/Expense
Pre-Tax Income
- Income Tax
Net Income
/ Shares Outstanding
Earnings Per Share
EBIT
Balance Sheet (Specific Date)
Assets
Current Assets (<1 Year)
Cash & Cash Equivalents
Marketable Securities
Accounts Receivable
Inventory
Other Current Assets
Long-Term Assets (>1 Year)
Long-Term Investments
Fixed Assets
Goodwill
Other Long-Term Assets
Liabilities
Current Liabilities (<1 Year)
Payables & Accrued Expenses
Short-Term Debt
Other Current Liabilities
Long-Term Liabilities (>1 Year)
Long-Term Debt
Other Long-Term Liabilities
Shareholder Equity
Preferred Stock
Common Stock & Additional Paid-In Capital
Retained Earnings
Treasury Stock
Average Total Assets
- Average Current Liabilities
When To Use ROCE
When comparing the performance of companies in the same industry.
PROS
• Broader measure of capital efficiency.
• Simple to calculate and understand.
• Useful for capital-intensive industries.
CONS
• Can be skewed by high debt levels.
• Neglects timing of cash flow.
• Not reliable when comparing companies in different industries.
BE AWARE OF
• Inconsistencies in definition
• Sensitivity to short-term fluctuations
• High debt levels distorting results


ROCE | ROE | ROA | ROIC
WHAT DOES EACH RATIO MEASURES?
Measures the profitability and efficiency of a company in generating returns from both its equity and debt capital.
Measures the profitability and efficiency of a company in generating profits from its shareholders' equity. It indicates the return earned by shareholders on their investment in the company
Measures the profitability and efficiency of a company in generating profits from its total assets. It indicates how effectively a company utilizes its assets to generate earnings.
Gives insight into how effectively a company is using the money invested in it to generate profits. It's a metric that can help investors determine the quality of a management and their ability to generate a return on the total capital
FORMULAS
EBIT / EQUITY + LONG TERM DEBT
NET INCOME / ASSETS - LIABILITIES
NET INCOME / TOTAL ASSETS
NET OPERATING PROFIT AFTER TAX / EQUITY + LONG TERM DEBT - CASH
WHEN IS EACH SUITABLE FOR APPLY?
Most suitable when comparing the performance of companies in capital-intensive sectors, like manufacturing or utilities, where large investments in assets are common and where investments are finance from loans.
Best used for companies where equity financing is dominant, making it ideal for sectors like services, finance or IT.
Most useful for comparing companies in the same industry. Different industries use assets differently. Good for use when compare the results vs. last year or vs. budget. Good for real estate companies.
Suitable for evaluating companies that rely heavily on a combination of debt and equity for their operations, giving a holistic view of how well all sources of capital are being used.
WHO USES THESE RATIOS MOST?
Used by investors and analysts when assessing companies in sectors where the capital employed is a key determinant of success.
Preferred by shareholders and equity analysts to see how well their investments are performing in terms of net income generation.
Widely used by management teams and operations analysts to determine if the company's assets are being deployed efficiently.
Favoured by portfolio managers and strategic planners, especially when comparing companies that have different financing structures.

CHAPTER 3
THE TIME VALUE OF MONEY

THERE ARE two sets of data that we use in corporate finance: retrospective and prospective. Retrospective data is compiled in financial statements. These represent the historical performance of an enterprise and can be analyzed, compared, and extrapolated. Ratios are the tools of financial statement analysis and we just discussed them. In our driving analogy they are the rear view mirror.

Prospective data is compiled in financial projections. Projections are like looking at the road through the windshield. These represent management's forecast of how the enterprise will perform in the future. These projections can be analyzed, risk adjusted, and a present value of those future cash flows can be calculated. We will now get into the forward-looking aspects of finance with the concept of the time value of money (TVM).

Time is money, literally. If there is a prospect of receiving a certain sum, then the sooner you receive it, the more it is worth. **Interest rates** describe this relationship between present value and future value. This is the fundamental concept of finance. We will explore this relationship between present and future value from different angles and I will phrase it in different ways in order to let it sink in.

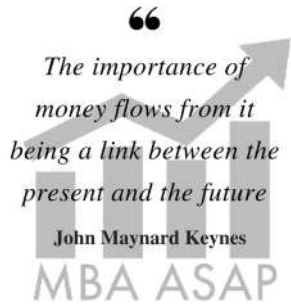
TVM represents the conceptual basis of finance. This is the underlying principle of how banks function, how stocks and bonds are

priced, how assets and companies are valued, how projects are analyzed, and how you should think about the nature and function of money.

The Time Value of Money is the Fundamental Principle of Finance

A bird in the hand is worth two in the bush. Receiving money today is worth more than getting the same amount in the future; and the value of the prospect of receiving money diminishes the further into the future the promise to deliver money. The rate at which the value of a dollar in the future decreases relative to a dollar today is inversely proportional to the rate at which a dollar invested today will increase in the future. Take a second to let that point sink in. The future and the present value are two sides of the same coin (pun intended!) and they are related to each other by the interest rate.

The concept of the time value of money explains why interest is paid or earned. Interest, whether it is on a bank deposit or debt, compensates the depositor or lender for the time value of money. Risk has to do with uncertainty. There is uncertainty of being repaid as a lender and uncertainty of future profits as a stock investor. Interest rates and required rates of return reflect the level of uncertainty or risk. One of the reasons credit cards carry such high interest rates is that the risk of other people defaulting on their balance is baked into the rate you pay.

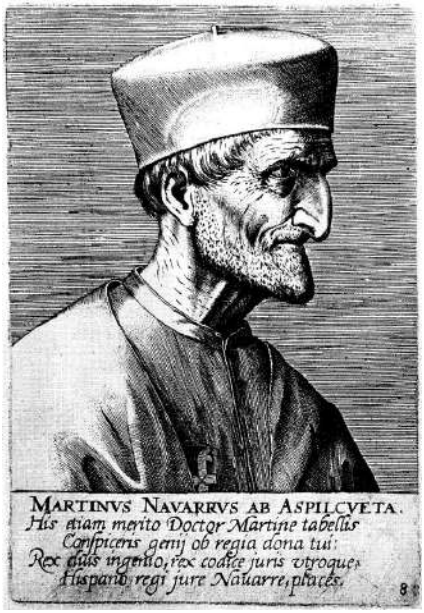


The monetary linchpin between the present and the future is

interest rates or discount rates. If you have a present value and you want to calculate a future value, we call it an interest rate. If you have future values and you want to estimate their worth today, we use a discount rate. Interest rates and discount rates are two sides of the same coin, to use a money metaphor.

The concept of Time Value of Money also underlies investment in stocks, bonds, or startups. Investing is about managing risk versus return. An investor is willing to forego spending their money now if they expect a favorable return on their investment in the future. The return required is related to the perceived risk of getting one's money back in the future; the higher the perceived risk, the higher the required rate of return. An investor is willing to part with their precious capital when greed overcomes fear; where the expected return exceeds the perceived risk.

CHAPTER 4
HISTORY LESSON

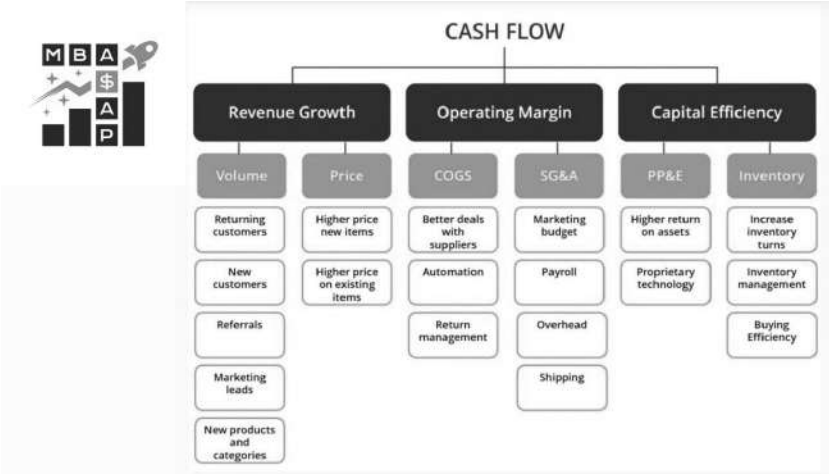


THE CONCEPT of the time value of money dates back to the 1500s. Martín de Azpilcueta (December 13, 1491 – June 1, 1586), also known as Doctor Navarrus, was a Basque theologian and an early

economist. He was the first person to develop a theory of money. He invented the mathematical concept of the time value of money. It's an idea that's about 500 years old.

CHAPTER 5
DCF: DISCOUNTING CASH FLOWS

DISCOUNTING **CASH FLOWS**



The core of corporate finance is calculating the present value of future cash flows. This concept is based on the time value of money. A company is essentially an entity that generates cash flows each year into the future. The trick is estimating those future cash flows and how

much they might grow or shrink and what the risks are to realizing (i.e. receiving) them.

It's difficult to peer into the fog of the future. This is where you have to polish your crystal ball and do some deep analysis of the business, its markets and competitors. All this information is compiled in a spreadsheet of financial projections and the bottom line represents the future cash flows in each year. These are discounted back to the present value at a discount rate that takes into account what similar investments, which are just streams of expected cash flows, are priced at in the market and any and all risks specific to the particular enterprise or asset we are contemplating buying or selling.

This is the basic concept of Valuation. Valuation is an estimate of something's worth. Something's worth can be set at auction where people bid and the highest bidder wins. But how do bidders know how much to bid and how much is too much? For income producing assets, like stocks, it's the present value of the future cash flows.

The stock market is essentially an auction where investors place **Bids**: how much they are willing to pay for a stock, and **Asks**: how much an investor is willing to sell for. When a Bid and Ask match, a transaction happens and a new price is set. Companies and assets, and even startups that don't have any revenues yet, are valued using this principle.

This technique of calculating the present value of a stream of cash flows becomes essential when trying to value start-ups that have no revenue history or assets, or companies that are predicted to grow rapidly. In these cases you can't rely on past performance and history in order to come up with a value based on P/E or their existing assets.

Discounting Cash Flows (DCF) is the technique favored by investment bankers, venture capitalists, private equity, hedge funds, savvy investors, banks and credit analysts, and CFOs. It's not difficult to understand and you will be amazed how useful and powerful it can be.

Let's go through an example.

6 Inputs FOR A DCF

Revenue Growth
Increase in a company's sales over time.

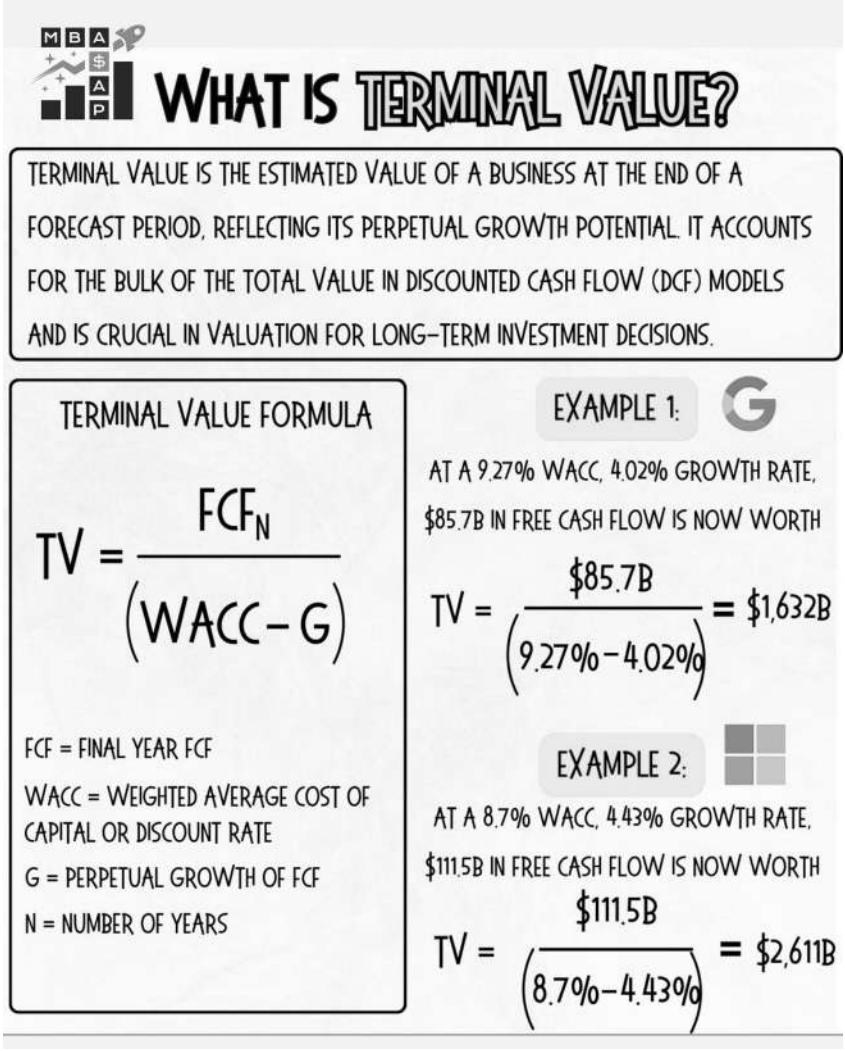
Determining NOPAT
Net Operating Profit After Tax.

Calculating Reinvestment
Funds for future growth investments.

Calculating Free Cash Flow to the Firm
Operating cash available to capital owners.

Discount Rate
Rates for present-value future cash flows.

Terminal Rate
Future value beyond projection period.


MBA
WHAT IS TERMINAL VALUE?
TERMINAL VALUE IS THE ESTIMATED VALUE OF A BUSINESS AT THE END OF A FORECAST PERIOD, REFLECTING ITS PERPETUAL GROWTH POTENTIAL. IT ACCOUNTS FOR THE BULK OF THE TOTAL VALUE IN DISCOUNTED CASH FLOW (DCF) MODELS AND IS CRUCIAL IN VALUATION FOR LONG-TERM INVESTMENT DECISIONS.
TERMINAL VALUE FORMULA
$TV = \frac{FCF_N}{(WACC - G)}$
FCF = FINAL YEAR FCF
WACC = WEIGHTED AVERAGE COST OF CAPITAL OR DISCOUNT RATE
G = PERPETUAL GROWTH OF FCF
N = NUMBER OF YEARS
EXAMPLE 1:
AT A 9.27% WACC, 4.02% GROWTH RATE, $85.7B IN FREE CASH FLOW IS NOW WORTH
$TV = \frac{\$85.7B}{(9.27\% - 4.02\%)} = \$1,632B$
EXAMPLE 2:
AT A 8.7% WACC, 4.43% GROWTH RATE, $111.5B IN FREE CASH FLOW IS NOW WORTH
$TV = \frac{\$111.5B}{(8.7\% - 4.43\%)} = \$2,611B$

DCF Cheat Sheet

STEPS

Purpose

DCF is used to estimate the intrinsic value of an investment or business by discounting future cash flows to their present value. It helps determine whether an investment opportunity is undervalued or overvalued.

1 HISTORICAL FINANCIAL ANALYSIS

The discount rate is the minimum rate of return acceptable to the investor.

The absolute value of the discount rate depends on the definition of the discount rate. Namely, for cash flow after debt servicing, a simple discount rate is used, while for cash flow before debt servicing, a weighted average cost of capital (WACC) is used.

2 INCOME STATEMENT FORECAST

Projections of revenue, COGS, OPEX, salareis, amortization, depreciation, interest etc..

3 CAPEX and NWC forecast

Forecasting capital expenditures (capex) is an important part of the valuation modeling process, as it allows businesses to plan for and manage their investment in long-term assets.

4 DEFINE PERIOD AND FORECASTING CF

5 DISCOUNT RATE DETERMINATION

The cost of equity is the expected rate of return that shareholders require to invest in a company's common equity. In other words, it is the return that investors expect to receive on their investment in the form of dividends and capital gains.

When conducting a valuation, the cost of equity is an important factor to consider as it reflects the investors' perception of risk associated with the company's future earnings. A higher risk perception means a higher cost of equity, and vice versa.

6 LONG TERM GROWHT RATE

7 TERMINAL VALUE CALCULATION

8 DISCOUNITNG CF

9 FINAL ADJUSTMENT AND SENSITIVITY

Pros

Takes earning potential into account

Flexible method that can be tailored to different types of assets or businesses

Future-orientated

Enables sensitivity analysis by allowing the modification of assumptions

Provides a quantitative basis for comparing different investment opportunities

Cons

DCF heavily depends on accurate and reliable projections

Subjectivity of these assumptions can introduce biases and uncertainty

A slight change in projected cash flows or discount rates can result in significant variations in the estimated present value

Difficulty in Determining the Discount Rate

CF FORECAST SUMMARY

	Year 1	Year 2	Year 3	Year 4	Year 5
EBITDA	5,000	5,881	6,297	6,738	7,209
Depreciation	(200)	(214)	(229)	(245)	(262)
Interest	(300)	(321)	(343)	(368)	(393)
Corporate tax	(753)	(803)	(858)	(919)	(983)
CAPEX adjustments	(700)	(500)	(500)	(500)	(500)
Change in NWC	(500)	(600)	(600)	(600)	(600)
Free Cash flow	2,050	3,443	3,766	4,106	4,471

DCF based valuation

Valuation	
Discounted FCF	12,540
Discounted CF Terminal	7,250
Total DCF	**19,790**
Cash	250
Financial Debts	(4,500)
Net financial position	(4,250)
NWC adjustments	(1,000)
Valuation before marketability discount	14,540
Discount for marketability	35%
Final valuation	**9,451**

Sensitivity analysis example (long term rate + WACC

WACC

- Risk-free rate
- Equity risk premium
- Relevered industry beta
- Sub-total
- Specific risk premium
- Cost of equity
- Industry - database
- Cost of debt
- Corporate tax rate
- Cost of Debt after tax
- (ND / EV)
- WACC
- Local inflation
- WACC result

Revenue forecast

- Identify key drivers
- Gather data
- Analyze trends
- Develop assumptions
- Create a forecast

COGS forecast

- Identify the components of COGS
- Collect data on historical COGS
- most important metric is % of cogs in Revenue
- Analyze trends
- Develop assumptions

OPEX forecast

- Use historical share in total revenues
- Adjusted for some assumptions

Depreciation forecast

- Start by identifying the assets that will be depreciated
- Determine useful life
- Choose a depreciation method
- Calculate depreciation expense

NWC

+ AR = Sales / DSO
+ Inevnotirs (I = Cogs / DIO)
- Payables (AP = Costs / DPO)

DCF Formula

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_n}{(1+r)^n}$$

CF_1 = Cash flow for the first period
CF_2 = Cash flow for the second period
CF_n = Cash flow for "n" period
n = Number of periods
r = Discount rate

Terminal Value (TV)

$TV = (FCFn \times (1 + g)) / (WACC - g)$

FCF = free cash flow.
n = year 1 of terminal period or final year.
g = perpetual growth rate of FCF.
WACC = weighted average cost of capital.

CHAPTER 6
PRESENT VALUE AND FUTURE VALUE

$100 INVESTED for one year, earning 5% interest, will be worth $105 after one year; therefore, $100 paid now and $105 paid exactly one year later both have the same value to a recipient who expects 5% return. That is, $100 invested for one year at 5% interest has a future value of $105. This assumes that inflation is zero percent and doesn't contribute to eroding the value.

The equation in this case would look like this:

$105 = $100 * (1+.05)

The general formula for solving for future value is:

FV = PV * (1+r)

Where FV is future value, PV is present value, and r is the interest rate.

The reciprocal formula, to solve for present value, juggles the terms using basic algebra and restates the relationship as:

PV = FV/(1+r)

. . .

It simply puts the (1+r) term on the other side of the equation to solve for PV by dividing both sides by (1+r). If this is confusing just replace (1+r) by the term X for the moment.

FV = PV * X

If you divide both sides by X you get: FV/X = PV * X/X

Since the term X/X is equal to one, the term goes away on that side of the equation. So we are left with: FV/X = PV

Now replace the X with (1+r) and you see the derivation of our equation.

Take a moment to make sure you really understand this because it is the basis of project finance and asset valuation. This is the formula we use to calculate future cash flows as a present value.

This concept is used to calculate the value today of a projected stream of income in the future.

Sit with this page for a while until these concepts are clear. **This is the core concept of finance.**

$PV = FV / (1+i)^n$

PV = present value

FV = future value (money to be received in the future)

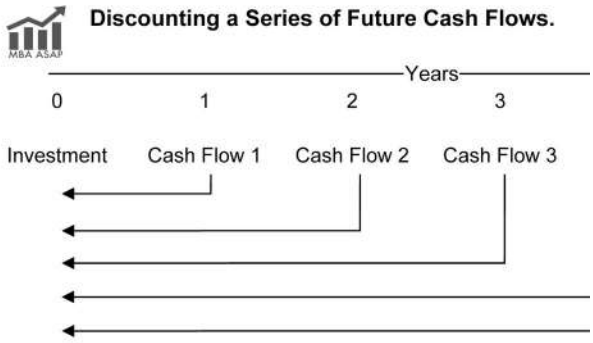
i = discount rate

n = number of periods until FV is received

Above is the general formula for calculating Present Value. All the terms are familiar from the previous page except the exponent n, which represents the year in which the particular payment is due.

For example if the Future Value was due in year 2 then n would be 2; if the Future Value was due in year 5 then n would be 5.

The further out in time, the bigger n is and the more discounting is applied to FV.



When there is a stream of FVs, these cash flows are all discounted based on the year they are coming in and then added together. The sum is the present value of the entire income stream.

Discounting Cash Flows is the core concept Corporate Finance.

CHAPTER 7
THE WEIGHTED AVERAGE COST OF CAPITAL (WACC)

IN THE WORLD of corporate finance, understanding the Weighted Average Cost of Capital (WACC) is crucial. This chapter aims to demystify WACC, making it accessible and clear.

WACC: A FUNDAMENTAL CONCEPT

At its core, WACC represents the average rate a company expects to pay to finance its assets, blending the costs of both equity and debt. It's a pivotal tool in assessing a company's financial strategy and ability to generate profit relative to its total capital.

The Balance Sheet: Assets, Liabilities, and Equity

Before diving into WACC, it's essential to grasp the basics of a company's balance sheet, the foundation on which WACC is built. A balance sheet reflects a company's financial health, indicating what it owns (assets) and owes (liabilities and equity). Here, the fundamental equation is Assets = Liabilities + Equity. Assets are what the company uses to operate and generate revenue, financed through debt and equity.

It's like when you buy something and put a down payment; the rest is a loan. The down payment is equity, and the loan is debt.

SIMPLIFYING WACC: THE HOUSE ANALOGY

Consider purchasing a house. If the house is worth $150,000 and you have a mortgage of $100,000, your equity is $50,000. This scenario mirrors a basic balance sheet where the house represents assets, the mortgage is debt, and your down payment is equity.

Deciphering the WACC Formula

The WACC formula is a blend of the costs associated with debt and equity proportionate to their presence in the overall capital structure. In this formula, the cost of equity usually outweighs debt cost due to the higher risk assumed by equity investors. Conversely, debt is cheaper, often secured against assets, and offers tax benefits. The interest paid on debt is tax deductible.

THE DEBT-EQUITY RATIO: A CRITICAL BALANCE

The ratio of debt to equity in a company's capital structure is a key determinant in the WACC calculation. While a higher proportion of debt might lower the WACC due to tax advantages, it also increases financial risk.

COST OF EQUITY: THE CAPM PERSPECTIVE

The Capital Asset Pricing Model (CAPM) is a standard method to estimate the cost of equity, which considers the comparative risk of investing in a company against a risk-free investment. It's a fundamental concept in determining the 'price' of equity.

Cost of Debt: Interest, Taxes, and Implications

Calculating the cost of debt involves understanding the interest rate on the company's debts and factoring in the corporate tax rate. Since interest payments are tax-deductible, they effectively reduce the cost of debt.

THE FULL WACC EQUATION

The WACC equation is expressed as:

$$WACC = V/E \times Re + V/D \times Rd \times (1 - Tc)$$

Here,

E represents the market value of equity,
D the market value of debt,
V the total value (E + D),
Re the cost of equity,
Rd the cost of debt, and
Tc the corporate tax rate.

Practical Application of WACC

WACC is more than a theoretical concept. It's applied in financial analyses, such as discounting future cash flows to their present value, and plays a pivotal role in company valuations and investment decisions.

The Role of WACC in Financial Strategy

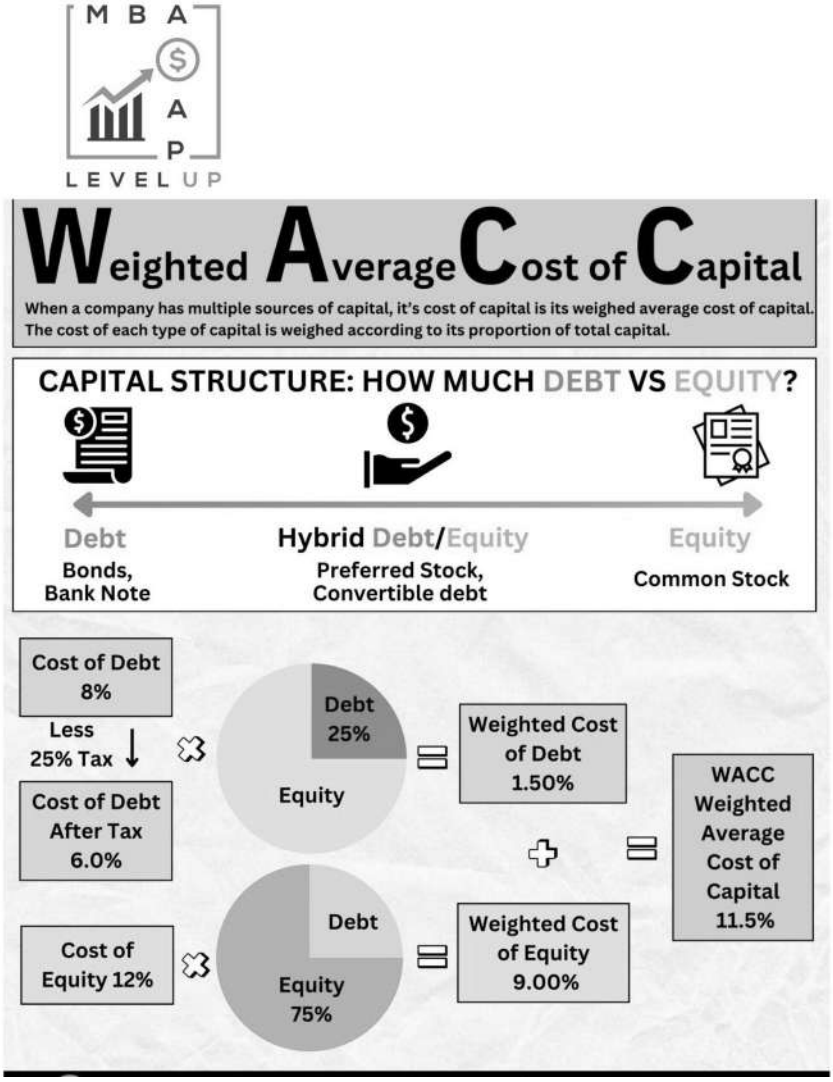
Understanding WACC is crucial for companies to make strategic choices about financing projects, mergers, acquisitions, and other significant decisions. It serves as a guide for setting target returns on investment and evaluating the cost-effectiveness of various financing options.

WACC is the discount rate used to discount estimated future cash flows back to present value.

CONCLUSION: WACC AS A DECISION-MAKING TOOL

WACC is a fundamental financial metric central to corporate finance and valuation. Its application spans various aspects of financial deci-

sion-making, offering insights into how a company should manage its capital structure for optimal financial health and strategic growth. As you progress in your understanding of finance, mastering WACC will be instrumental in analyzing and valuing businesses effectively.



CHAPTER 8
UNDERSTANDING FREE CASH FLOW FCF

INTRODUCTION TO FREE CASH FLOW

FREE CASH FLOW (FCF) represents the cash that a company generates after accounting for cash outflows to support operations and maintain its capital assets. It's a critical indicator of a company's financial health and ability to create additional shareholder value.

DEFINITION AND IMPORTANCE OF FREE CASH FLOW

FCF is the discretionary cash available for a company to deploy in various ways, such as paying dividends, reducing debt, or reinvesting in growth opportunities. It's an essential metric in **discounted cash flow (DCF) valuations**, providing a basis for estimating future cash flows and determining the present value of an income-producing asset.

COMPONENTS OF FREE CASH FLOW

1 Operating Cash Flow: The starting point for calculating FCF, representing the cash generated from regular business operations.

2 Capital Expenditures: Funds a company uses to acquire or upgrade physical assets like machinery or property.

3 Working Capital: Reflects the short-term liquidity position of a company, calculated as current assets minus current liabilities.

CALCULATING FREE CASH FLOW

The formula for FCF is:

FCF=EBIT×(1−Tax Rate)+Depreciation−Capital Expenditures±Changes in Working Capital

- **EBIT (Earnings Before Interest and Taxes)**: A measure of a company's profitability.
- **Depreciation**: Added back to EBIT because it's a non-cash expense.

The Role of Depreciation in FCF

Depreciation spreads the cost of an asset over its useful life, impacting net income but not cash flow. Since FCF focuses on cash generation, depreciation expenses are added back to EBIT.

Working Capital in FCF Calculation

Working Capital changes reflect the cash tied up in day-to-day operations. It's crucial in understanding the cash flow dynamics of a company, especially for those with significant inventory or accounts receivable.

INTERPRETATION AND APPLICATION OF FREE CASH FLOW

Understanding FCF allows management and investors to gauge a company's performance, efficiency, and potential for growth. It's particularly relevant for:

- **Investment Decisions**: Evaluating opportunities for expansion or acquisitions.
- **Shareholder Value**: Deciding on dividends or share buybacks.

• **Debt Management**: Assessing the company's ability to pay down debt.

CASE STUDIES AND EXAMPLES

Here are some scenarios illustrating how FCF analysis impacts corporate decision-making and valuation.

Incorporating case studies and examples can significantly enhance the understanding of Free Cash Flow (FCF) concepts. Below are two case studies that illustrate FCF's practical application and significance in corporate finance.

Case Study 1: Turnaround Strategy - Reviving a Struggling Retailer

Background: Consider a fictional retail company, "RetailMax," facing declining sales and increasing debt levels. RetailMax's management makes the decision to implement a turnaround strategy.

Analysis:

1 Assessing FCF: Initially, RetailMax's FCF is negative due to heavy capital expenditures and poor sales. This situation signals potential liquidity issues and an inability to sustain operations without external financing.

2 Strategic Changes: Management decides to close unprofitable stores, reduce inventory levels, and renegotiate supplier contracts. These actions are aimed at reducing capital expenditures and improving working capital.

3 Outcome: After a year, RetailMax's FCF turns positive, reflecting better operational efficiency. The company uses this cash to pay down debt, signaling improved financial health to investors.

Lessons Learned: This case study demonstrates how FCF can be a critical indicator of a company's health and the effectiveness of its turnaround strategies. Positive FCF post-restructuring reflects RetailMax's improved ability to generate cash internally.

. . .

Case Study 2: Tech Company's Expansion - Balancing Growth and Shareholder Value

Background: A fast-growing tech company, "InnovTech," is contemplating reinvesting its substantial FCF into new product development versus paying dividends to shareholders.

Analysis:

1 Evaluating FCF: InnovTech's substantial FCF results from strong sales and modest capital expenditures, reflecting its asset-light business model.

2 Decision Making: The management faces a choice: use the FCF for an aggressive expansion strategy, including R&D and potential acquisitions, or reward shareholders through dividends or share buybacks.

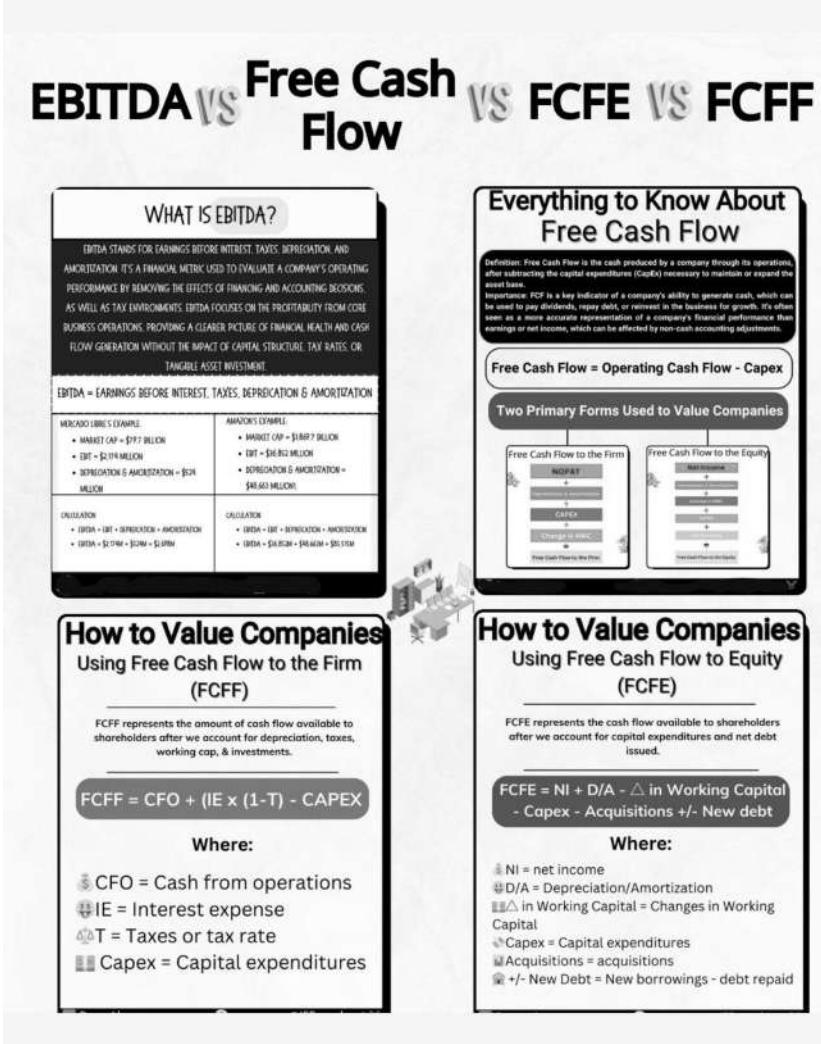
3 Outcome: InnovTech decides to allocate 60% of its FCF to growth initiatives and 40% to shareholder returns. This balanced approach facilitates sustained growth while maintaining shareholder loyalty.

Lessons Learned: This case highlights the strategic importance of FCF allocation in balancing growth with shareholder expectations. It also illustrates how FCF serves as a tool for assessing available options for using excess cash.

These case studies provide concrete examples of how FCF analysis is integral to strategic decision-making in different business scenarios. They offer practical insights into the application of FCF in corporate finance.

CONCLUSION

FCF is a versatile and vital metric in corporate finance, providing a clear picture of a company's financial strength and capacity for growth. Understanding its nuances is key for anyone involved in financial analysis or corporate decision-making.


EBITDA VS Free Cash Flow VS FCFE VS FCFF
WHAT IS EBITDA?
EBITDA STANDS FOR EARNINGS BEFORE INTEREST, TAXES, DEPRECIATION, AND AMORTIZATION. IT'S A FINANCIAL METRIC USED TO EVALUATE A COMPANY'S OPERATING PERFORMANCE BY REMOVING THE EFFECTS OF FINANCING AND ACCOUNTING DECISIONS, AS WELL AS TAX ENVIRONMENTS. EBITDA FOCUSES ON THE PROFITABILITY FROM CORE BUSINESS OPERATIONS, PROVIDING A CLEARER PICTURE OF FINANCIAL HEALTH AND CASH FLOW GENERATION WITHOUT THE IMPACT OF CAPITAL STRUCTURE, TAX RATES, OR TANGIBLE ASSET INVESTMENT.
EBITDA = EARNINGS BEFORE INTEREST, TAXES, DEPRECIATION & AMORTIZATION
MERCADO LIBRE'S EXAMPLE:
• MARKET CAP = $77.7 BILLION
• EBIT = $2.174 MILLION
• DEPRECIATION & AMORTIZATION = $524 MILLION
CALCULATION
• EBITDA = EBIT + DEPRECIATION + AMORTIZATION
• EBITDA = $2.174M + $524M = $2.698M
AMAZON'S EXAMPLE:
• MARKET CAP = $1.86B ? BILLION
• EBIT = $36.852 MILLION
• DEPRECIATION & AMORTIZATION = $48.663 MILLION
CALCULATION
• EBITDA = EBIT + DEPRECIATION + AMORTIZATION
• EBITDA = $36.852M + $48.663M = $85.515M
Everything to Know About Free Cash Flow
Definition: Free Cash Flow is the cash produced by a company through its operations, after subtracting the capital expenditures (CapEx) necessary to maintain or expand the asset base.
Importance: FCF is a key indicator of a company's ability to generate cash, which can be used to pay dividends, repay debt, or reinvest in the business for growth. It's often seen as a more accurate representation of a company's financial performance than earnings or net income, which can be affected by non-cash accounting adjustments.
Free Cash Flow = Operating Cash Flow - Capex
Two Primary Forms Used to Value Companies
Free Cash Flow to the Firm
NOPAT
+
CAPEX
+
Change in NWC
=
Free Cash Flow to the Firm
Free Cash Flow to the Equity
Net Income
+
+
+
=
Free Cash Flow to the Equity
How to Value Companies
Using Free Cash Flow to the Firm (FCFF)
FCFF represents the amount of cash flow available to shareholders after we account for depreciation, taxes, working cap, & investments.
FCFF = CFO + (IE x (1-T) - CAPEX
Where:
CFO = Cash from operations
IE = Interest expense
T = Taxes or tax rate
Capex = Capital expenditures
How to Value Companies
Using Free Cash Flow to Equity (FCFE)
FCFE represents the cash flow available to shareholders after we account for capital expenditures and net debt issued.
FCFE = NI + D/A - △ in Working Capital - Capex - Acquisitions +/- New debt
Where:
NI = net income
D/A = Depreciation/Amortization
△ in Working Capital = Changes in Working Capital
Capex = Capital expenditures
Acquisitions = acquisitions
+/- New Debt = New borrowings - debt repaid

CHAPTER 9
NPV: NET PRESENT VALUE

NOW THAT WE have gone over the conceptual basis of Corporate Finance we are going to look at the main techniques and tools used in financial analysis and decision-making.

In business we invest in projects that make money in the future. We pay now and intend to reap the rewards in the future. Usually a project or asset will make money as a stream of revenues and profits over years. It could also be a project whose main benefit is savings. We need the ability to calculate whether that stream of future cash flows is worth more than the money we need to invest to buy it or build it.

The way we look at decisions about whether to fund a project or calculate the value of an asset is to turn that stream of future dollars into today's dollars. Then we compare that sum of present values to the cost; if the cost is more than the total present value, we don't do the deal; if it is less, it is considered a good investment.

This is the way projects are analyzed and assessed as go or no go, and how income producing assets and acquisitions are valued for sale or purchase.

So far we have analyzed and calculated the value of future cash flows and brought them back to present value. **Net Present Value** (NPV) takes this idea a step further and accounts for the transactional aspect. We must "purchase" the future cash flows either by:

- Buying a bond or stock, or
- Acquiring a company, or
- Purchasing an income-producing asset, or
- Undertaking a project and incurring the costs of developing or building the income-producing asset.

Net present value "nets out" the cost of acquiring the future cash flows. NPV compares the cost in today's dollars to the present value of projected future income or benefits also in today's dollars. Its only worth doing if the price is less than our present value assessment of the future benefits.

NPV is the main tool used to value assets and make decisions about projects, purchases, mergers, or acquisitions. The spreadsheets can get pretty complicated when they are populated with all the costs, revenue and expense projections, and assumptions about timing and risk, but the basic idea is always to compare the costs to the future benefits and compare them apples to apples by taking into account the time value of money.

NPV answers a simple question: does the present value of all the money coming in over the life of the project outweigh how much money we have to spend in order to receive it? Net present value is just that, it's the net between the present value of these two streams: the money going out and the money coming in.

We ask whether NPV is greater than 0. If it's greater than 0, then the costs are less than the benefits and we should do the project or make the investment.

That's our decision rule: is the NPV bigger than 0? We can construct the formula for NPV by following along very closely with what we did in our discussion of discounting cash flows.

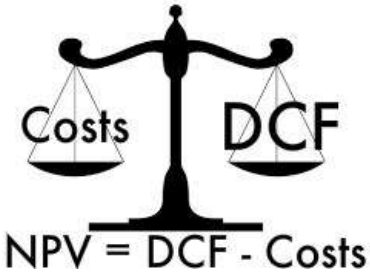
The NPV is equal to the initial cost, which has a minus sign in front of it, plus the present value of what's coming in off the project as cash

flows. Cash flow in period 1, discounted one period back, plus the cash flow in period two, discounted two periods back, the cash flow in period 3, discounted back three periods, you get the idea, plus all the other cash flows coming in discounted by their period.

What we do is take that initial cost and weigh that against the present value of all the cash coming in. We're going to "net" the two. There's a minus sign on the costs, and plus signs on all of the present value cash flows.

We ask how all the money going out weighs against all the money coming in. Think of it like a balance. If we know the initial investment and the stream of money coming in from the project in the future, we can measure the NPV as the difference between the two; the net between those two streams.

As the initial investment becomes larger, the NPV become smaller. You can see that the NPV, whether it's bigger than 0 or less than 0, depends on that balance between the money going out and the money coming in. Let's work a problem and compute an NPV in practice.



NPV EXAMPLE CALCULATION

Analyze the table of cash flows below and compute the NPV if the discount rate is 15%

EXAMPLE PROJECT
Today
Year: 0 1 2 Sum (NPV)
-$3,000 $1,500 $1800 $300

. . .

Let's think about whether it's worth it to do this project. In period 0, today; we need to spend $3,000. Is it worth it to spend that $3,000? What do we expect to get in return?

What are the cash flows coming in off the project? We have a cash flow of $1,500 coming in at the end of year one. And we've got a cash flow of $1,800 coming in at the end of year two. If we just sum up the cash flows, a minus 3000 (it is minus because it is a cost) plus 1500 plus 1800, we get an answer of $300. This project is generating cash. It's profitable. The money coming in is bigger than the money going out.

That's the sum of all the cash flows, but that's without any discounting. We haven't accounted for the fact that we have to wait a year to get the $1,500. And then wait another year after that to get the $1,800. Remember: to use money you have to pay; there is a cost of capital. So what do we have to pay? In this case, we have to pay that 15% discount rate. That is the cost of capital in this example. 15% is our hurdle rate.

Today
Year: 0 1 2 Sum (NPV)
-$3,000 $1,500 $1800 $300
Present
Value: $1500/(1.15)^1$ $1800/(1.15)^2$
NPV
@15% -$3,000 + $1,304.35 + $1,361.06 = **-$334.59**

We need to adjust the cash flows for the time value of money by discounting them to the present value. We take that $1,500 and discount it one period at 15% and we get $1,304.35. Then we take the $1,800 and discount it two periods at 15% and we get $1,361.06. Now when we sum the present value of all those cash flows, we get ***minus*** $334.59, which tells us that the project destroys value. It's not worth doing.

It's a profitable project, but we don't want to do it. We will pass. Why would we ever *not* want to do a project that's profitable? It all

comes down to the 15% discount rate. That 15% indicates what the hurdle rate is for the profitability of the project. This project might be profitable, but it is not profitable enough to justify the required 15% return. If our investors require a 15% return to take the risk of that project, we're not going to be able to deliver it to them with a project like this.

Let's examine the main drivers in that net present value calculation. First is cash flow. More cash is better than less. The second is the timing. The further the cash flow is out in the future, the deeper it gets discounted.

And the third driver is the discount rate. The higher the discount rate, the deeper the cash flows get discounted and the lower the NPV. The lower the discount rate, the less discounting, the better the project. Lower discount rates, higher NPV. Higher discount rates, lower NPV.

Net present value is the benchmark metric. It is our best capital budgeting tool. It incorporates the timing of the cash flows. It incorporates the opportunity cost. The opportunity cost is the cost we incur by committing to this project and forgoing other options that could make us money. That discount rate quantifies, in essence, what else could we do with the money.

The fact that we're discounting implicitly incorporates the opportunity cost. And it incorporates risk. If we think the project is a lot riskier, what can we do to incorporate that in our analysis? We can increase the discount rate to reflect that risk.

NPV is objective. It is not concerned with whether we "like" the project or not. It relies on the quality of our forecasting discount rates. We can lay this out and calculate it in a way that is presentable and explainable to anybody. It's an arm's length metric. NPV is transparent. We could sit down together with a spreadsheet and go over it and explain all the assumptions to each other. This process allows us to test the veracity of our assumptions and get buy-in from others.

Net present value weighs the costs and benefits of cash coming in

versus cash going out. NPV gives us an objective, arm's length, and transparent metric for capital budgeting.

$$\mathbf{NPV = -C_0 + C_1/(1+i) + C_2/(1+i)^2 + \ldots + C_T/(1+i)^T}$$

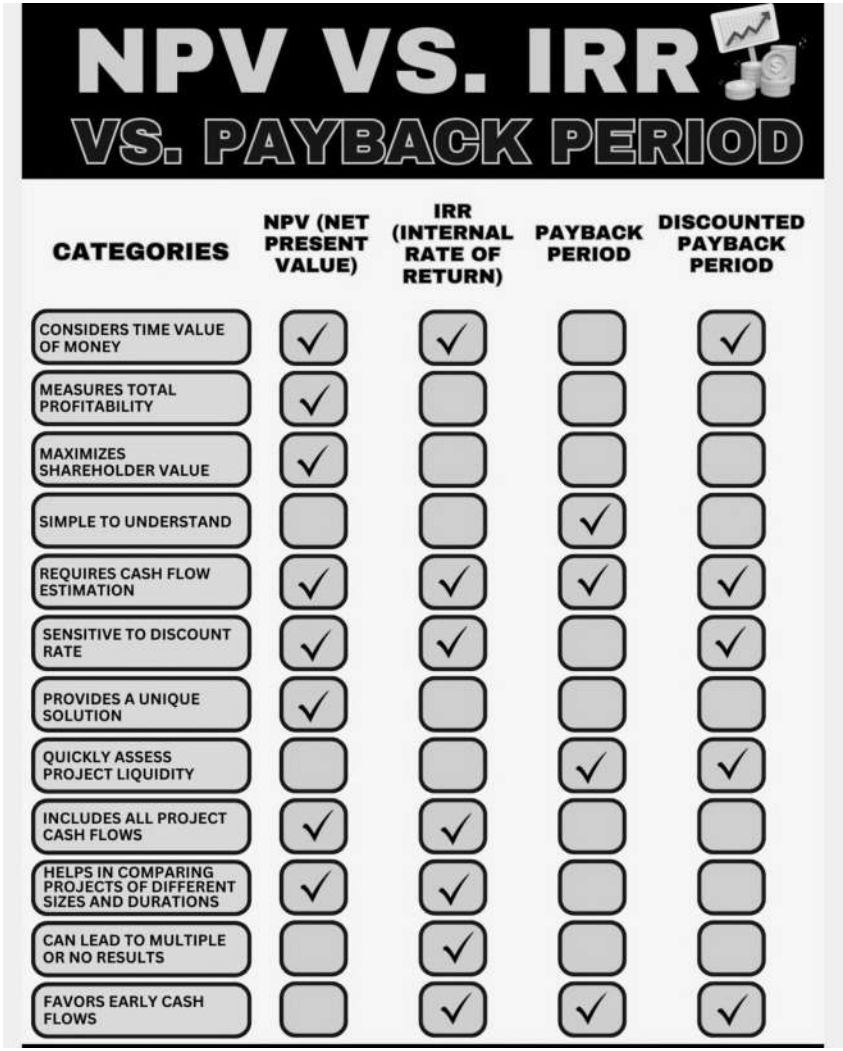
-C0 = Initial Investment
C = Cash Flow
i = Discount rate
T = Time

The main drivers of NPV are:

- **Cash Flow**. Obviously, more cash is better than less.
- **Timing**. The further the cash flow is out in the future, the deeper it gets discounted.
- **Discount Rate**. The higher the discount rate, the deeper the cash flows get discounted and the lower the NPV. The lower the discount rate, the less discounting, the better the project. Lower discount rates, higher NPV. Higher discount rates, lower NPV.

Lower discount rates, higher NPV.
Higher discount rates, lower NPV.

Net present value weighs the costs and benefits of cash coming in versus cash going out, and gives us an objective, arm's length, and transparent metric for capital budgeting.


NPV VS. IRR
VS. PAYBACK PERIOD
CATEGORIES
NPV (NET PRESENT VALUE)
IRR (INTERNAL RATE OF RETURN)
PAYBACK PERIOD
DISCOUNTED PAYBACK PERIOD
CONSIDERS TIME VALUE OF MONEY
MEASURES TOTAL PROFITABILITY
MAXIMIZES SHAREHOLDER VALUE
SIMPLE TO UNDERSTAND
REQUIRES CASH FLOW ESTIMATION
SENSITIVE TO DISCOUNT RATE
PROVIDES A UNIQUE SOLUTION
QUICKLY ASSESS PROJECT LIQUIDITY
INCLUDES ALL PROJECT CASH FLOWS
HELPS IN COMPARING PROJECTS OF DIFFERENT SIZES AND DURATIONS
CAN LEAD TO MULTIPLE OR NO RESULTS
FAVORS EARLY CASH FLOWS

CHAPTER 10
IRR: INTERNAL RATE OF RETURN

NEXT WE ARE GOING to explore using the Internal Rate of Return (IRR) as a capital budgeting tool. We will explore how to use it for deciding how to best to invest money and allocate resources.

Internal rate of return is derivative of NPV. **Internal rate of return is the discount rate that makes the NPV from a particular project equal to zero.** The higher the internal rate of return of a proposed project, the more desirable the project.

NPV tells us whether the present value of the cash coming in exceeds the cash going out. NPV calculates the net of the present value of the cash flows. With IRR we come at the issue from a different angle.

First we compute an NPV and then we ask what discount rate sets the NPV equal to 0. The discount rate that makes the cash outflow equal to the present value of the cash inflows is the IRR. Our decision rule with IRR is we're going to invest if that rate is bigger than our hurdle rate.

Internal rate of return is solving for how much we need to discount the cash flows in order to drive the value out of the project. It's a measure of the resiliency of the cash flows. It measures the capacity of the project to withstand and recover from difficulties.

The more we discount, the more that drives down the NPV. How much do we have to discount it and still stay bigger than 0? That's

what IRR tells us. This decision rule is similar to our net present value decision, as we'll see graphically.

IRR takes the Net Present Value, which is a numerical value, and restates it as a percentage. This makes it more intuitive and comprehensible.

It's difficult for us to grasp the meaning of a large number. It has little context. If I say the NPV is $3,537,000 it means little by itself. If I tell you the internal rate of return on the project is 25%, it's easy to intuitively grasp. It takes the net present value and converts it into a percentage that's easier to grasp and understand.

It gives us a more intuitive and appealing take on the NPV of a project. IRR doesn't tell the whole story though and it's best to always use it in conjunction with NPV. We will discuss caveats related to IRR later. NPV provides the scale and IRR provides the intuition.

Let's examine IRR in formulaic terms. When we discussed the net present value formula, NPV was equal to the initial cost weighed against all of the cash flows in future years.

$$NPV = \text{- Initial Costs} + CF_1/(1+r) + CF_2/(1+r)^2 + CF_3/(1+r)^3 \ldots.$$

That is our formula for NPV. To calculate IRR we're going to take that formula and replace r the discount rate, with IRR and set that equal to 0. The discount rate that sets this series of numbers equal to 0 is the IRR.

$$0 = \text{- Initial Costs} + CF_1/(1+IRR) + CF_2/(1+IRR)^2 + CF_3/(1+IRR)^3 \ldots.$$

Remember there is a minus sign in front of the Initial Costs.

It's difficult and time consuming to solve the polynomial equation for IRR with pen and paper. There is no direct calculation. It is an iterative process. You make a guess, do the calculation, and adjust as you overshoot or undershoot the mark. Here is the formula to get an idea of how cumbersome it is to populate and calculate.

Internal Rate of Return

n = number of cash flows

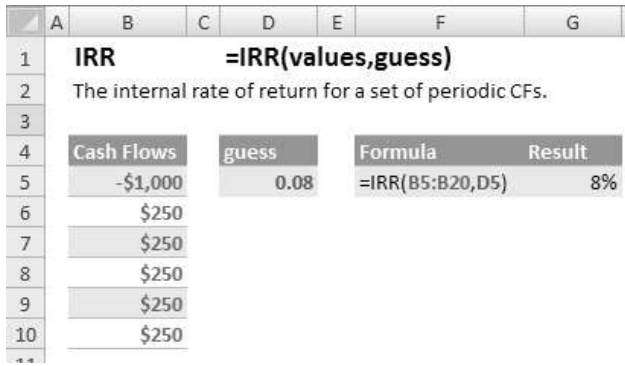
CF_i = cash flow at period j.

IRR = Internal Rate of Return

$$0 = \sum_{i=1}^{k} CF_i \cdot \left[\frac{1-(1+IRR)^{-n_j}}{IRR} \right] \cdot \left[(1+IRR)^{\frac{-\sum nq}{q<j}} \right] + CF_0$$

As you can well imagine, IRR was not a very useful tool before financial calculators, computers and spreadsheets.

But it's easy to do in a spreadsheet or on a financial calculator. They have IRR functions built in. Here is an example from Excel. You just put in the range of cash flows and make a guess at the IRR. The computer will chug through the calculations and provide the answer in a split second.

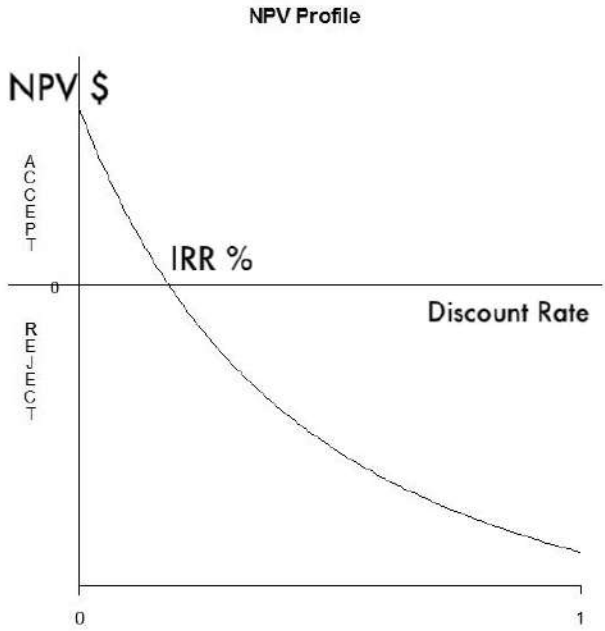


	A	B	C	D	E	F	G
1		**IRR**		**=IRR(values,guess)**			
2		The internal rate of return for a set of periodic CFs.					
3							
4		Cash Flows		guess		Formula	Result
5		-$1,000		0.08		=IRR(B5:B20,D5)	8%
6		$250					
7		$250					
8		$250					
9		$250					
10		$250					

I prefer Excel or a spreadsheet program on a computer because you can build out the model and save the results. This is important if later your boss or client asks how you came up with that number. Always save your work for later reference.

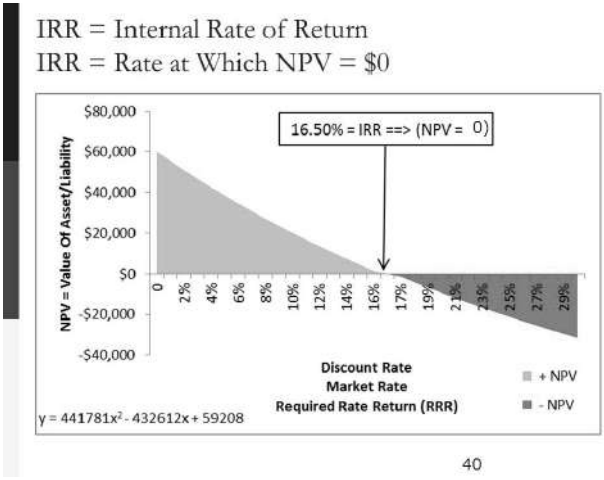
Let's look at the relationship between NPV and IRR graphically. Here we have a project that has a positive NPV and we graph the value of the net present value in dollars.

As we discount the cash flows with progressively higher and higher discount rates, the NPV declines. At some point, it crosses 0. The point at which NPV crosses 0, the discount rate that sets NPV equal to 0, is the IRR.



Any time the discount rate is below the IRR, it's a positive NPV project. So if our hurdle rate is 7% and the IRR is 12% it's judged a good project. IRR is similar to NPV, except that we have discounted the

cash flows to a percentage rate where the discounting just crosses to negative, at 0.



Now we can say, for example, the return on this project, the IRR, is 12%. That is easier to understand than saying the net present value is $1,613,672, which is just a big number with no context. We don't have a good idea what it means. But if the return is 12%, we can compare: 12% relative to a 7% cost on capital. We have a comparison. That's a good project.

IRR EXAMPLE

Time	Cash Flow	Trial 1 (10%)	Trial 2 (20%)	Trial 3 (13%)
0	(6,128)	(6,128)	(6,128)	(6,128)
1	2,500	2,273	2,083	2,212
2	5,000	4,132	3,472	3,916
NPV	1,372	277	-572	0

Let's think this through with an example. Let's say we were spending $6,128 to generate cash of $2,500 in year one, and $5,000 in year two. If we don't do any discounting at all and just add up the cash flows that would be $1,372.

Now lets discount the cash flows at 10%. We discount the $2,500 back one period at 10%, and discount the $5,000 back two periods at 10%. That gives us a net present value of $277.

If instead of discounting at 10%, we discounted at 20%, we get a net present value of ***minus*** $572. So what must have happened somewhere in between?

At some point the net present value crossed from positive to negative. If we solve it, that actually happens at 13%. That's the point where we are discounting it enough to draw all the value out of it.

In the above example we keep guessing and solving for different discount rates until we converge on an answer. IRR is a really easy thing to calculate in Excel. Built into Excel is an IRR function. There are many tutorials online that will show you how to use that function. It solves the polynomial equation, finds the root, sets it to 0, and gives us the solution automatically.

IRR confounds easy math solutions. There is no formula for IRR where you can plug in the numbers and calculate the solution. You calculate IRR via an iterative process of trial and error. Each successive iteration gets closer and finally converges on the solution. This type of convergence algorithm is what computers excel at.

Microsoft Excel does it by crunching through thousands of calculations. Before spreadsheets you could estimate IRR with cross-reference tables. Now with a few mouse clicks, we get an accurate IRR solution.

IRR is a really easy thing to calculate in Excel. Built into Excel is an IRR function. There are many tutorials online that will show you how to use that function. It solves the polynomial equation, finds the root, sets it to 0, and gives us the solution automatically.

IRR accounts for the timing, the opportunity cost, and the risk of a project in a similar way to NPV. IRR is a good capital budgeting tool but it should not be relied upon as a standalone measure. We should always compute it alongside of the gold standard NPV.

IRR SHORTFALLS AND CAVEATS

IRR provides insight. It's an intuitive way to grasp the value of a stream of cash flows, but there are a couple of caveats. IRR is a summary type of number. As with all summaries, compressing the solution squeezes out information. By reducing the solution to a percentage IRR is easy to grasp. But there are issues surrounding the information that gets eliminated.

NPV is our gold standard capital budgeting tool. IRR is like NPV. We have looked at the similarities and differences, as well as the benefits of including IRR in our analysis.

IRR has a couple of complications in practice that we will now look at.

The first case is when cash flows in a stream get reversed. When they come in and go out, come in and go out, IRR can get confused for some math reasons that we will look at.

WHEN CASH FLOWS ARE REVERSED DURING A PROJECT

IRR can be misleading when cash flows reverse from positive to negative during a project. In a situation where money comes in and then money goes out, the sign, negative and positive, flips. Any time cash flows flip negative and positive in a stream of cash flows, we need to be careful using IRR.

Lets use a machine acquisition as an example. We acquire a machine and the machine generates revenue. Then we have to retool the machine in year three and we spend more cash. Then it generates more revenue. That's two sign changes. There is money out for the initial purchase, money in, money out for the retooling, and then more money in. Any time the cash flow direction flips a couple of times; IRR can give us confusing results.

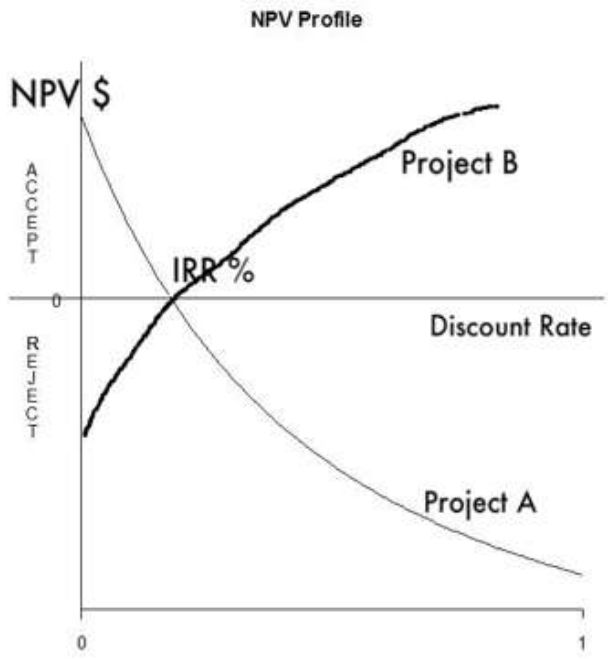
Borrower Type Loan Flow IRR Example

Project	CF0	CF1	IRR	NPV @ 10%
A	(400)	500	25%	54.54
B	400	(500)	25%	(54.54)

Consider these two projects, A and B. In the first, we are going to spend $400 to generate $500 a year from now. In this case the NPV comes out to $54.54 and the IRR comes out to 25%. In the second project we've got $400 coming in, and then spend $500 a year from now. This stream looks like a loan from the borrower's side. We are getting money in, and paying it back later. In the case of project B, the net present value is ***negative*** $54.54. It is the inverse scenario of Project A. In this case, we aren't making $54; we are losing $54. But when we calculate IRR, it's the same 25%.

Did something get messed up? No, the math is correct. Remember IRR is the interest rate that sets NPV to zero. This is the point where the costs are equal to the present value of the future cash flows. The solution to what rate sets NPV equal to 0 is 25%. But the NPV has flipped from positive to negative. We need be careful any time there's a flip in the sign of the cash flows.

Let's look at it from the graph perspective. For project A the NPV is downward sloping and above zero until it crosses at the IRR. But in project B the NPV is negative and upward sloping until it crosses zero at the IRR.



They have the same IRR. But for a low discount rate, project B is going to give us a negative NPV, whereas project A is going to give us a positive NPV. At a high discount rate, Project B is NPV positive. IRR really gets confused when there are multiple changes in cash flow direction in a stream.

The solution is to always put IRR next to NPV. If you compute an IRR, compare it with the net present value. NPV always serves as a check on whether you're getting the right capital budgeting decision.

SCALE AND IRR

Another issue is comparing the scale of different projects or investments using IRR. If we have mutually exclusive projects that we want to compare and decide between, it's hard to meaningfully compare them with IRR alone. Mutually exclusive means we can't pursue all proposed projects because of limited resources. We must choose one or the other. In choosing one, we must forgo the other. A financial offi-

cer's job is to decide to pursue the best opportunities that generate the most money.

It's not clear whether a higher IRR indicates a higher NPV. Let's go through an example of how we would compare mutually exclusive projects with the IRR.

Project	CF0	CF1	IRR	NPV @ 10%
1	(1)	2	100%	0.82
2	(100)	120	20%	9.1

In project 1 we are just going to spend $1. This would represent a modest incremental project. That's going to generate $2 in period 1.

That looks like a great project from an IRR standpoint. We are spending $1 in order to make $2. That's a 100% IRR!

Or we could also choose project 2. That would cost $100, and would generate $120. That is only a 20% IRR.

It looks like project 1 is better than project 2 in terms of adding value, because it's got such a bigger IRR.

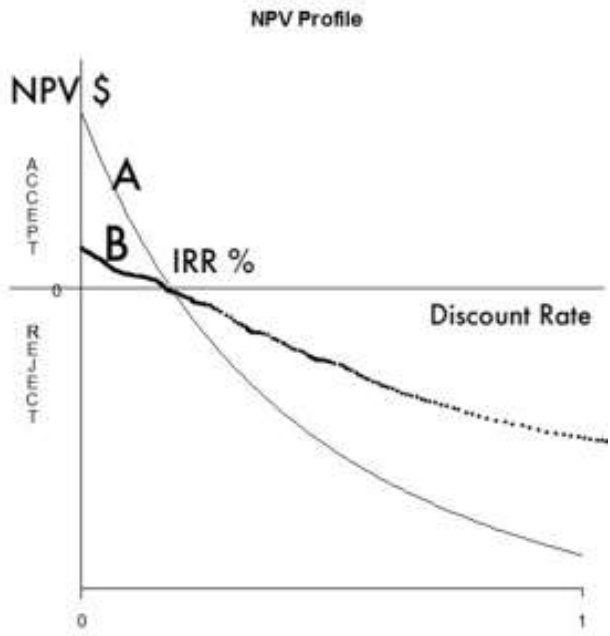
But if we compute the net present value, project 1 generates $0.82. Project 2 generates $9.10. Project 2 has a much bigger NPV. We should do Project 2.

Project 2 is much better from a net present value standpoint. It's generating a lot more value in total dollars for the firm. It's just that project 1 is generating a relatively higher IRR number. IRR doesn't take the scale of the project into account.

The best way to avoid being misled is, again, to put IRR next to NPV. That checks whether IRR is meets our hurdle rate *and* whether the scale is giving us the right decision.

We can analyze this graphically by looking at two projects. Projects A and B have the same IRR, but Project A has a much higher net

present value. Project A is preferable to Project B. For all discount rates less than the IRR, it's going to generate more NPV.



Always put that IRR next to a net present value in order to check for scale issues.

MULTIPLE OR NO SOLUTION TO IRR

Situations exist where there is no solution to the IRR polynomial.

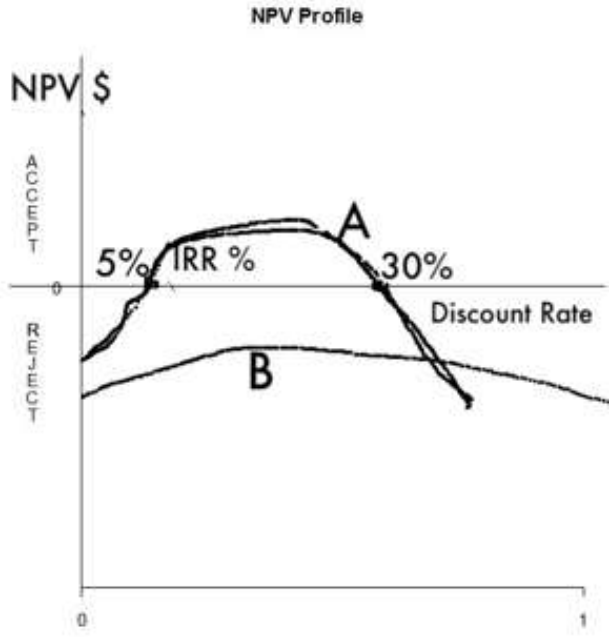
If you put the cash flows into the IRR formula in Excel and it won't give you an answer, it could be that there's multiple IRRs or no solution.

Project	CF0	CF1	CF2	IRR
A	(100)	235	136	[5%, 30%]
B	(100)	120	(50)	--

Consider the example above. We are analyzing two projects. In both projects we spend 100. In Project A we plan to make 235 in year 1 and 136 in year 2. Project B is forecast to make 120 and negative 50.

In Project A there are actually two IRR's, not one. In Project B there is no IRR.

IRR is the solution to a math equation and there are scenarios where there is no solution to the math problem. Graphically, Project A and B look like this: for Project A the NPV gets bigger for a while, then starts to go down. This project has two IRR's. NPV crosses zero twice as the discount rate increases.



It could also be the case that a project is such a total loser that it never gets up to a positive NPV. That is the case with Project B. It has no IRR because it never crosses zero.

Once again, how do we address this issue? Make sure to compare an IRR calculation to a net present value. This way you can always check whether IRR is giving you the right capital budgeting decision.

SHORTFALLS OF IRR SUMMARY

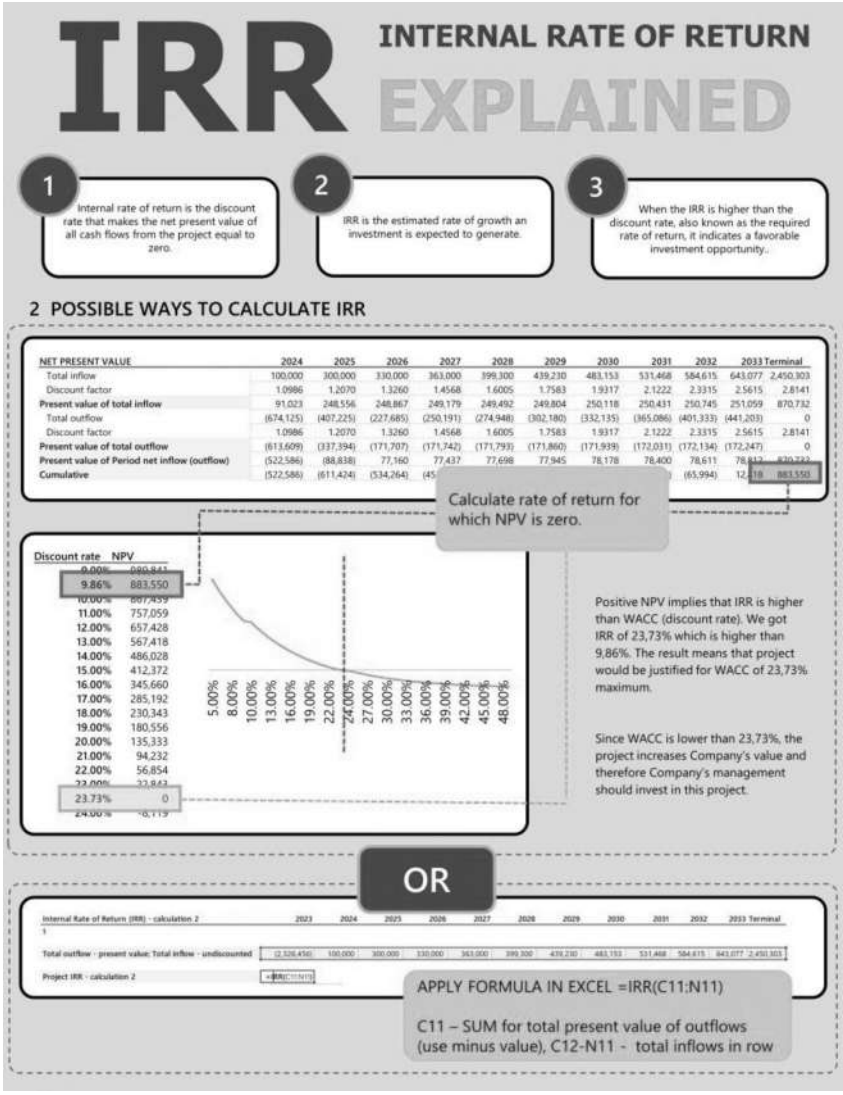
IRR is a good capital budgeting tool. But it is not a standalone measure. IRR alone can be misleading because of:

- The nature of mutually exclusive projects,
- The scale problem,
- Cash flow timing issues,
- Whether or not there's an answer or solution

Always check IRR next to the net present value. As long as you aware of these caveats and compare IRR to the NPV, IRR is a legitimate analysis tool. IRR provides intuitive insight. It helps us get an idea of what the return on the project is relative to the discount rate.

Corporations and investors invest in real assets that are intended to be productive in generating income. Some of these assets such as apartment buildings, factories, offices, machinery and computers are tangible. Others such as brand names and patents are intangible.

The decision-making tools of corporate finance assess the value of proposed projects and income producing assets based on the time value of money and its relation to risk. We rank projects based on the present value of their future cash flows. How we do that is called discounted cash flow (DCF) valuation.


IRR
INTERNAL RATE OF RETURN
EXPLAINED
1
Internal rate of return is the discount rate that makes the net present value of all cash flows from the project equal to zero.
2
IRR is the estimated rate of growth an investment is expected to generate.
3
When the IRR is higher than the discount rate, also known as the required rate of return, it indicates a favorable investment opportunity..
2 POSSIBLE WAYS TO CALCULATE IRR
NET PRESENT VALUE 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 Terminal
Total inflow 100,000 300,000 330,000 363,000 399,300 439,230 483,153 531,468 584,615 643,077 2,450,303
Discount factor 1.0986 1.2070 1.3260 1.4568 1.6005 1.7583 1.9317 2.1222 2.3315 2.5615 2.8141
Present value of total inflow 91,023 248,556 248,867 249,179 249,492 249,804 250,118 250,431 250,745 251,059 870,732
Total outflow (674,125) (407,225) (227,685) (250,191) (274,948) (302,180) (332,135) (365,086) (401,333) (441,203) 0
Discount factor 1.0986 1.2070 1.3260 1.4568 1.6005 1.7583 1.9317 2.1222 2.3315 2.5615 2.8141
Present value of total outflow (613,609) (337,394) (171,707) (171,742) (171,793) (171,860) (171,939) (172,031) (172,134) (172,247) 0
Present value of Period net inflow (outflow) (522,586) (88,838) 77,160 77,437 77,698 77,945 78,178 78,400 78,611 78,812 870,732
Cumulative (522,586) (611,424) (534,264) (45 (65,994) 12,818 883,550
Calculate rate of return for which NPV is zero.
Discount rate NPV
9.86% 883,550
11.00% 757,059
12.00% 657,428
13.00% 567,418
14.00% 486,028
15.00% 412,372
16.00% 345,660
17.00% 285,192
18.00% 230,343
19.00% 180,556
20.00% 135,333
21.00% 94,232
22.00% 56,854
23.73% 0
5.00% 8.00% 10.00% 13.00% 16.00% 19.00% 22.00% 24.00% 27.00% 30.00% 33.00% 36.00% 39.00% 42.00% 45.00% 48.00%
Positive NPV implies that IRR is higher than WACC (discount rate). We got IRR of 23,73% which is higher than 9,86%. The result means that project would be justified for WACC of 23,73% maximum.
Since WACC is lower than 23,73%, the project increases Company's value and therefore Company's management should invest in this project.
OR
Internal Rate of Return (IRR) - calculation 2 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 Terminal
Total outflow - present value; Total inflow - undiscounted (2,326,456) 100,000 300,000 330,000 363,000 399,300 439,230 483,153 531,468 584,615 643,077 2,450,303
Project IRR - calculation 2 =IRR(C11:N11)
APPLY FORMULA IN EXCEL =IRR(C11:N11)
C11 – SUM for total present value of outflows (use minus value), C12-N11 - total inflows in row

CHAPTER 11
RISK - REWARD TRADEOFF

EVERY COMPANY HAS different products and services, customers and competitors, technologies, and employees. These unique circumstances and situations mean that every company listed on the stock market has a different risk profile.

How can we measure and compare the relative risk profile of different stocks?

The **equity risk premium** is the excess return that investors in the stock market require above and beyond the interest rate provided by U.S treasury bonds. U.S. Treasury bonds are the de facto risk-free alternative because they are backed by the government's ability to pay.

Investors think in terms of a **risk-reward** tradeoff. The additional anticipated return compensates investors for taking on the higher risk of investing in stocks.

. . .

The stock risk premium is a theoretical estimate. It can't be known precisely. No one knows how stocks will perform going forward.

We can estimate the risk premium by measuring past stock market performance.

Markets compensate investors for taking on the higher risk of investing in stocks.

Estimates of the equity premium vary. A reasonable estimate of the equity premium is around 5.5%. That premium compensates us for putting our money in the stock market instead of a treasury bond.

But what if we invest in the stock of an individual company? What if we put our money in shares of Apple, Goldman Sachs, or Tesla? What rate of return should we expect to invest our hard-earned money in a single company's stock?

Individual stocks are riskier than investing in the overall stock market. That is why mutual funds and ETFs are so popular. They mirror the entire market or sectors of it.

We need to determine the premium to compensate us for taking on the additional risk. We need to **measure individual stock risk and price that risk.**

Our estimate for the annual average overall stock market return is 5.5%. We need a way to think about and measure the risk of individual stocks to calculate the risk premium required for investing in that stock.

. . .

How much risk premium should we expect to compensate us for investing in a specific stock? How do we measure how risky that stock is?

Let's consider what makes a stock risky. Stocks are volatile. **Volatility** is another way of saying that their price fluctuates up and down a lot. We can't predict the future. We never know if a stock will go up or down in the short term.

The short-term movement of a stock is a random walk. It may jump around more than the average share. One day, it's up 15%; the next, it goes down 25%.

We can evaluate a stock's past performance to understand the stock-specific risk. For example, we can see how much the share price has varied in their prior performance.

We aren't limited to investing in only one specific stock. Instead, we can invest in many different stocks with different risk profiles. Holding a bunch of various commodities is called a **portfolio**.

Some of the various stocks go up when others go down, and vice versa.

Think of investing in a suntan lotion company and an umbrella company. When the sun is shining, people buy suntan lotion, and that stock performs well.

. . .

But few people are buying umbrellas, and that stock languishes. When it rains, the umbrella company makes sales, and that stock soars. But the suntan lotion company is quiet.

The two companies perform the opposite. Each offsets some of the risks of the other.

Umbrellas and suntan lotion are simplified examples that illustrate the concept of **diversification**. Investing in different stocks creates **diversification that reduces portfolio risk**.

I might require a 20% return to hold a risky stock. However, some other investors might be willing to accept less than a 20% return because they will place the stock in a diversified portfolio. As a result, the company will raise money from the investor requiring the cheaper required rate of return. From the company's perspective, that is a less expensive **cost of capital**.

CHAPTER 12
MEASURING RISK

INTRODUCTION

IN THE EVER-FLUCTUATING world of finance, risk lurks behind every investment decision. Understanding and measuring this risk is not just a part of wise investing—it's the very heart of it.

From the early days of trading at the docks to modern digital trading engines, understanding and quantifying risk has been central to the investor's strategy.

This chapter delves into the abstract yet crucial concept of risk, offering tools and insights for its quantifiable assessment.

DEFINING RISK

Risk, in the financial sense, embodies the uncertainty associated with the future returns of an investment. It's the potential deviation from expected outcomes. Risks come in various forms - market risk, credit risk, liquidity risk, etc. For instance, market risk involves the overall

economy or securities market, while credit risk pertains to the default possibility of a borrower.

This uncertainty is the trade-off for potential rewards; the greater the risk, the higher the potential reward, and vice versa.

THE NATURE OF RISK

Risk, inherently abstract, is often perceived as a vague threat looming over investments. However, in finance, this abstraction transforms into something quantifiable. For instance, while two stocks may appear similar at first glance, a deeper analysis might reveal stark differences in their risk profiles, affecting their suitability for different investment strategies.

Risk is as much a psychological concept as it is a financial one. Market conditions, news, and personal experiences influence investors' perceptions of risk. The 2008 financial crisis, for instance, drastically altered risk perceptions globally, emphasizing the importance of understanding risk beyond mere numbers.

QUANTITATIVE MEASUREMENT OF RISK

The cornerstone of risk assessment in finance is its quantification. Risk remains an elusive concept without concrete measures, impossible to manage effectively. Quantitative analysis, therefore, becomes indispensable in understanding and mitigating investment risks.

Quantitative analysis involves applying mathematical and statistical methods to measure and compare risk levels across different investments.

KEY CONCEPTS IN RISK MEASUREMENT

The two pivotal statistical tools in risk measurement are variance and standard deviation. Variance measures the spread of a set of numbers (like returns of an investment) from their mean, providing a sense of the investment's volatility. Standard deviation, the square root of variance, offers a more intuitive measure of risk.

CASE STUDY: STOCK ANALYSIS

Consider two stocks: Stock A, a large, established company with stable earnings and minor fluctuations in price, and Stock B, a smaller, more volatile tech startup with significant price swings, signaling higher variance and greater risk. While Stock A shows less price fluctuation, indicating lower risk, Stock B exhibits higher volatility, suggesting greater risk but also potentially higher rewards.

UNDERSTANDING NORMAL DISTRIBUTION

Normal distribution, or the bell curve, is a foundational concept in statistics and risk assessment. Most values in a normally distributed set lie close to the mean, with probabilities diminishing as you move away. This concept helps investors understand the expected range of returns and their deviations in finance.

ADVANCED RISK MEASUREMENT TOOLS

Tools like Beta, the Sharpe Ratio, and the Capital Asset Pricing Model (CAPM) offer sophisticated ways to measure and compare investment risk. Beta measures a stock's volatility relative to the overall market; the Sharpe Ratio evaluates return per unit of risk; and CAPM links expected returns to market risk.

ADDITIONAL CASE STUDY: COMPARING CORPORATE BONDS

Consider Bond X, issued by a financially stable corporation, and Bond Y, issued by a riskier startup. Bond X offers lower yields but more stability, reflecting lower credit risk, while Bond Y offers higher yields but with higher credit risk, appealing to different types of investors.

PRACTICAL APPLICATION: VARIANCE AND STANDARD DEVIATION

To calculate the variance of an investment's returns, one would square the difference between each return and the mean, then average these squared differences. The standard deviation is the square root of this variance, providing a more tangible measure of risk.

MODERN TOOLS FOR RISK ANALYSIS

Technological advancements have revolutionized risk analysis. Tools like Excel and programming languages like Python, equipped with financial libraries, allow for sophisticated risk assessment and management. These tools enable investors to crunch large datasets, applying complex formulas efficiently and accurately.

RISK CASE STUDY: COMPARING CORPORATE BONDS

In this case study, we'll examine the risk profiles of two corporate bonds, Bond X and Bond Y, to demonstrate the application of risk measurement concepts in a different asset class.

Background

Bonds are generally considered less risky than stocks but are not without risk. Bond risk primarily arises from interest rate changes, issuer creditworthiness, and market conditions.

Bond X and Bond Y

- **Bond X**: Issued by a company with a stable financial history and strong credit rating. It offers a modest but consistent yield.
- **Bond Y**: Issued by a newer company with a more volatile finan-

cial history and a lower credit rating, offering a higher yield to compensate for the increased risk.

Risk Assessment

To assess the risk of these bonds, we'll look at two key factors: credit risk and interest rate risk.

• **Credit Risk**: with its lower credit rating, Bond Y has a higher credit risk than Bond X. This means there's a higher chance that Bond Y's issuer may default on its payments.

• **Interest Rate Risk**: Assume both bonds have a similar duration. However, Bond Y, with its higher yield, might be more sensitive to interest rate changes. If interest rates rise, Bond Y's price could drop more significantly than Bond X's.

Quantitative Analysis

• **Yield to Maturity (YTM)**: This calculation shows the total return expected on a bond if held to maturity. Bond Y's higher YTM indicates a higher expected return, but also a higher risk.

• **Duration**: This measures a bond's sensitivity to interest rate changes. A detailed analysis might reveal that Bond Y has a longer duration, making it more volatile in changing interest rate environments.

Case Study Conclusion

Through this comparison, Bond X emerges as the lower-risk option, suitable for conservative investors seeking stability. Bond Y, meanwhile, offers higher potential returns but at the cost of higher risk, appealing to investors with a greater risk appetite.

This case study exemplifies how different investment instruments can be analyzed for risk, providing valuable insights for diversified portfolio management.

MEASURING RISK CHAPTER CONCLUSION

Risk, in its essence, is about uncertainty. But through the lens of finance, this uncertainty is not just a concept to be wary of; it's a quan-

tifiable element that can be measured, analyzed, and, most importantly, managed.

Understanding and measuring risk is fundamental to making informed investment decisions. This chapter has explored key concepts and tools in risk measurement, providing a foundation for investors to assess and manage the risks inherent in their portfolios.

FURTHER READING AND RESOURCES

For those interested in deepening their understanding, recommended readings include "Against the Gods: The Remarkable Story of Risk" by Peter L. Bernstein and "The (Mis)behavior of Markets" by Benoit Mandelbrot.

CHAPTER 13
CAPITAL BUDGETING TOOLS SUMMARY

LETS TAKE stock of the capital budgeting tools that we've talked about:

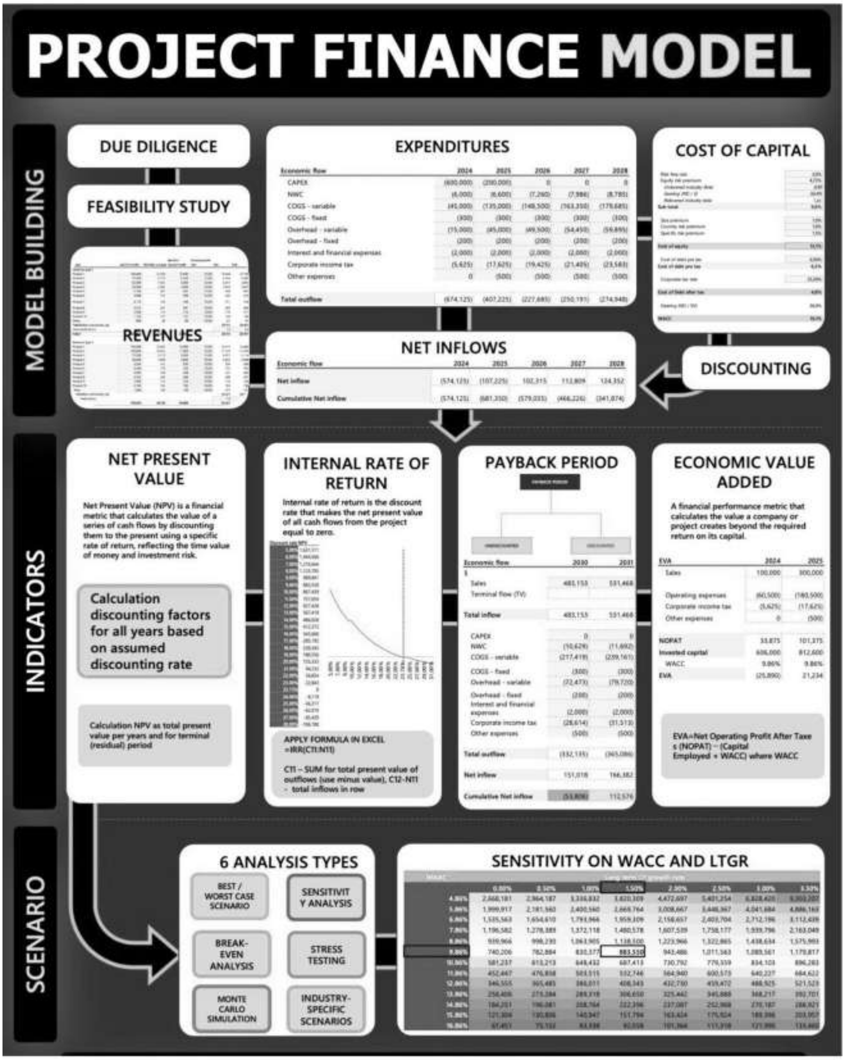
- Net present value
- IRR
- Accounting ratios

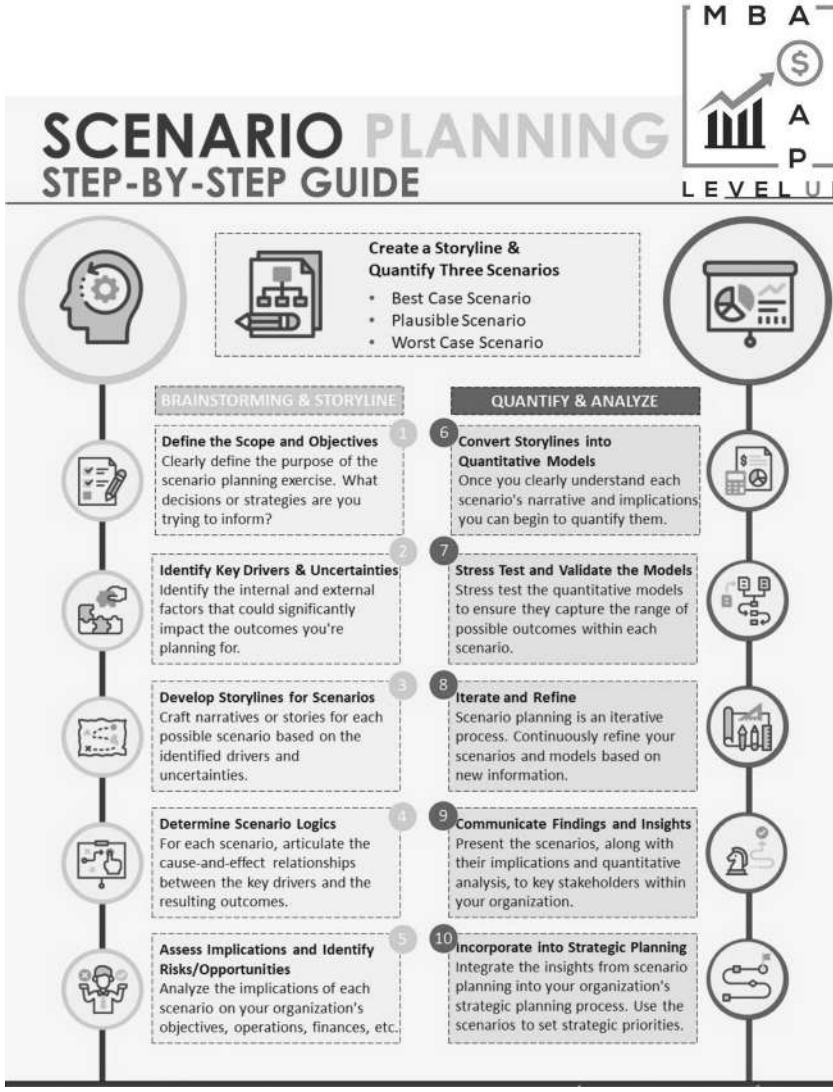
CFOs rely on multiple metrics when making capital budgeting decisions. There are pros and cons to IRR, net present value and accounting ratios. What is important to understand is that each one of those data points represents an interesting and informative perspective.

Using a portfolio of different capital budgeting tools helps make for better financial decisions. NPV is the gold standard.

We can also use earnings multiples and other accounting ratios that we talked about. They can provide interesting information but should not be solely relied upon in making capital budgeting decisions. Always include NPV and IRR. Include IRR and NPV next to ROE or ROA so that you can make a more informed and better decision.

Use these capital budgeting tools that have a solid theoretical and empirical foundation and start making better financial decisions.


PROJECT FINANCE MODEL
MODEL BUILDING
DUE DILIGENCE
FEASIBILITY STUDY
REVENUES
EXPENDITURES
COST OF CAPITAL
NET INFLOWS
DISCOUNTING
INDICATORS
NET PRESENT VALUE
Net Present Value (NPV) is a financial metric that calculates the value of a series of cash flows by discounting them to the present using a specific rate of return, reflecting the time value of money and investment risk.
Calculation discounting factors for all years based on assumed discounting rate
Calculation NPV as total present value per years and for terminal (residual) period
INTERNAL RATE OF RETURN
Internal rate of return is the discount rate that makes the net present value of all cash flows from the project equal to zero.
APPLY FORMULA IN EXCEL =IRR(C11:N11)
C11 – SUM for total present value of outflows (use minus value), C12-N11 - total inflows in row
PAYBACK PERIOD
ECONOMIC VALUE ADDED
A financial performance metric that calculates the value a company or project creates beyond the required return on its capital.
EVA=Net Operating Profit After Taxes (NOPAT) – (Capital Employed × WACC) where WACC
SCENARIO
6 ANALYSIS TYPES
BEST / WORST CASE SCENARIO
SENSITIVITY ANALYSIS
BREAK-EVEN ANALYSIS
STRESS TESTING
MONTE CARLO SIMULATION
INDUSTRY-SPECIFIC SCENARIOS
SENSITIVITY ON WACC AND LTGR


SCENARIO PLANNING
STEP-BY-STEP GUIDE
M B A
A
P
LEVEL UP
Create a Storyline &
Quantify Three Scenarios
• Best Case Scenario
• Plausible Scenario
• Worst Case Scenario
BRAINSTORMING & STORYLINE
QUANTIFY & ANALYZE
1 Define the Scope and Objectives
Clearly define the purpose of the scenario planning exercise. What decisions or strategies are you trying to inform?
2 Identify Key Drivers & Uncertainties
Identify the internal and external factors that could significantly impact the outcomes you're planning for.
3 Develop Storylines for Scenarios
Craft narratives or stories for each possible scenario based on the identified drivers and uncertainties.
4 Determine Scenario Logics
For each scenario, articulate the cause-and-effect relationships between the key drivers and the resulting outcomes.
5 Assess Implications and Identify Risks/Opportunities
Analyze the implications of each scenario on your organization's objectives, operations, finances, etc.
6 Convert Storylines into Quantitative Models
Once you clearly understand each scenario's narrative and implications you can begin to quantify them.
7 Stress Test and Validate the Models
Stress test the quantitative models to ensure they capture the range of possible outcomes within each scenario.
8 Iterate and Refine
Scenario planning is an iterative process. Continuously refine your scenarios and models based on new information.
9 Communicate Findings and Insights
Present the scenarios, along with their implications and quantitative analysis, to key stakeholders within your organization.
10 Incorporate into Strategic Planning
Integrate the insights from scenario planning into your organization's strategic planning process. Use the scenarios to set strategic priorities.


5 EBITDA RATIOS
EBITDA MARGIN
INTEREST COVERAGE
DEBT SERVICE COVERAGE
FIXED CHARGE COVERAGE
FUNDED DEBT TO EBITDA
5 CASH FLOW RATIOS
CASH FLOW MARGIN
FREE CASH FLOW MARGIN
CASH FLOW COVERAGE RATIO
OPERATING CASH FLOW RATIO
CASH CONVERSION EFFICIENCY (CCE)
THE FINANCIAL ANALYSIS SCORE CARD
Horizontal Analysis (Trend Analysis)
Vertical Analysis (Common Size Analysis)
Ratio Analysis
Profitability Ratios
Efficiency Ratios
Liquidity Ratios
Solvency Ratios
Sensitivity & Scenario Analysis
Cash Flow Analysis
VERTICAL ANALYSIS
HORIZONTAL ANALYSIS
PROFITABILITY
LIQUIDITY
SOLVENCY
EFFICIENCY
SENSITIVITY ANALYSIS
MBA
$
A
P
PROJECT PROFITABILITY
NPV
IRR
PP
PI
DUPONT ANALYSIS
Net Profit Margin
Asset Turnover
Financial Leverage
Gross Profit Margin
Operating Profit Margin
Pre-tax Profit Margin
Effective Tax Rate
Fixed Asset Turnover
AR Turnover
AP Turnover
Inventory Turnover
Debt Ratio
Equity Ratio
DUPONT RATIO = Profitability x Efficiency x Leverage

CHAPTER 14
STOCKS

THE ROLE **of Stocks in Business Funding and Growth**

In corporate finance, understanding stocks is fundamental to grasping how businesses raise capital, grow, and interact with the financial markets. Stocks are not just financial instruments but are critical components of a company's financial strategy and structure. This guide aims to shed light on the significance of stocks from a corporate finance perspective.

At its essence, a stock is a form of security that signifies ownership in a corporation, signaling a claim on the company's assets and profits. There are primarily two categories of stock: common and preferred. Common stock generally grants shareholders voting rights and eligibility for dividends. In contrast, preferred stockholders usually have no voting rights but enjoy priority over common stockholders for asset and earning claims.

Investing Ratios

RATIO	FORMULA	MEASSURE OF
LIQUIDITY AND EFFICIENCY		
QUICK RATIO	Cash & Equivalents + Receivables / Current Liabilities	Immediate short-term debt-paying ability
CURRENT RATIO	Current Assets / Current Liabilities	Short- term debt-paying ability
ACCOUNTS RECEIVABLE TURNOVER	Net Sales / Average Accounts Receivables	Efficiency of collection
INVENTORY TURNOVER	Cost of Good Sold / Average Inventory	Efficiency of Inventory management
DAYS' SALES UNCOLLECTED	Accounts Receivable / Net Sales x 365	Liquidity of receivables
DAYS' SALES IN INVENTORY	Ending Inventory / Cost of Good Sold x 365	Liquidity of inventory
TOTAL ASSET TURNOVER	Net Sales / Average Total Assets	Efficiency of assets in producing sales
SOLVENCY		
DEBT RATIO	Total liabilities / Total assets	Creditor financing and leverage
EQUITY RATIO	Total equity / Total assets	Owner financing
DEBT-TO-EQUITY RATIO	Total liabilities / Total equity	Debt versus equity financing
TIMES INTEREST EARNED	Earnings Before Interest & Taxes / Interest Expense	Protection in meeting Interest payments
PROFITABILITY		
GROSS MARGIN	Revenue - Cost of Good Sold / Revenue	Gross Profit in each sales dollar
PROFIT MARGIN	Earnings / Net Sales	Net Income in each sales dollar
RETURN ON ASSETS	Net Income / Average Total Assets	Overall profitability of assets
RETURN ON EQUITY	Net Income - Preferred Dividends / Average Common Stockholders' Equity	Profitability of owner investment
BOOK VALUE PER SHARE	Shareholders' Equity / Shares Outstanding	Liquidation at reported amounts
EARNINGS PER SHARE	Net Income - Preferred Dividends / Shares Outstanding	Net Income per share
MARKET PROSPECTS		
PRICE TO EARNINGS RATIO	Share Price / Earnings Per Share	Market value relative to earnings
DIVIDEND YIELD	Annual Cash Dividends per Share / Share Price	Cash return per share owned

From a corporate finance standpoint, issuing stocks is a strategic method for companies to raise capital. Companies can sell shares to the public instead of relying on loans and incurring debt, effectively trading equity for funding. This capital can be pivotal for various purposes, from expanding operations to funding new projects and paying off debts.

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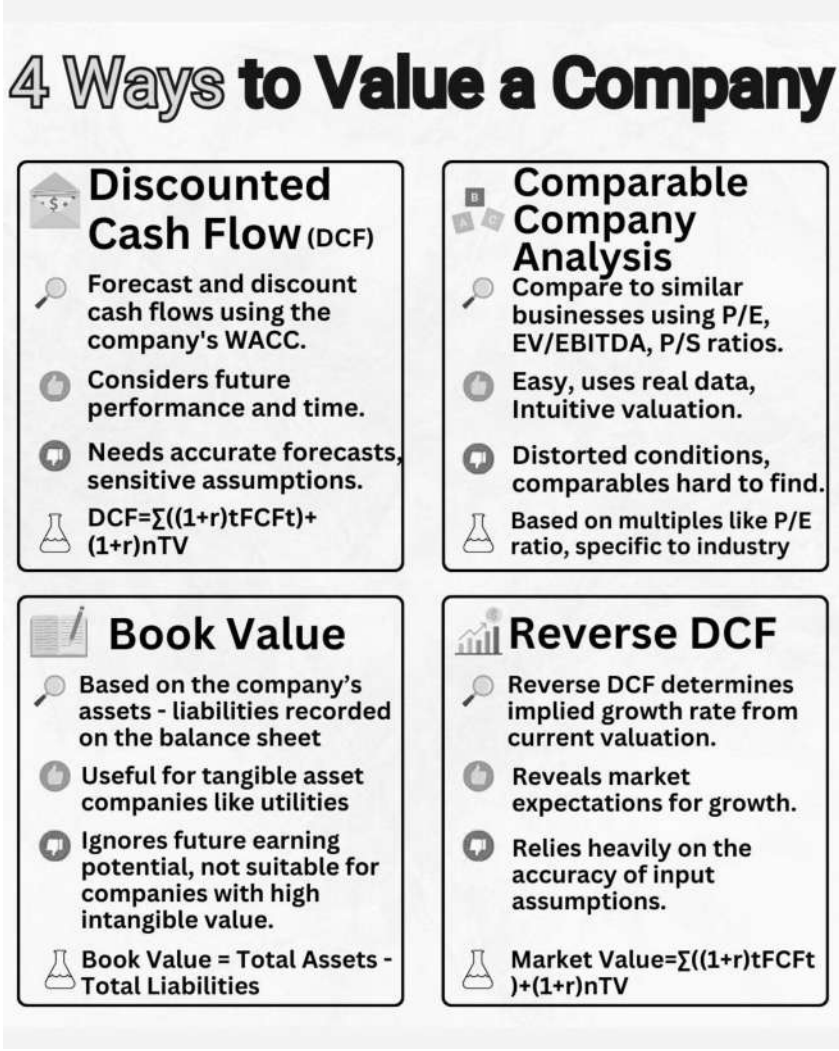
The issuance of stocks also opens up a company to the public markets, exposing it to market dynamics and investor sentiments. When a company performs well, its stock value often increases, reflecting the market's positive reassessment of its worth. This increase in stock value can benefit a company, as it might lead to increased investor interest and a higher company valuation.

However, this exposure to the public markets comes with inherent risks. Stock prices are subject to market volatility, influenced by internal company performance and external economic conditions. This volatility can lead to fluctuating stock values, affecting the company's market capitalization and potentially its future financing capabilities.

Stock exchanges, such as the New York Stock Exchange (NYSE) and Nasdaq, play a critical role in corporate finance. They provide platforms where stocks are bought and sold, facilitating liquidity and enabling companies to access capital from a broader investor base. Through stock exchanges, companies engage with investors, who in turn become part-owners and stakeholders in the company's success.

In summary, in the landscape of corporate finance, stocks are more than just investment vehicles. They are integral tools for companies to finance growth, engage with the markets, and navigate the complex interplay of investor relations and capital management.

Understanding the role and dynamics of stocks is crucial for anyone delving into corporate finance, as it provides insights into how companies fund their operations and strategize for long-term success and sustainability.


4 Ways to Value a Company
Discounted Cash Flow (DCF)
Forecast and discount cash flows using the company's WACC.
Considers future performance and time.
Needs accurate forecasts, sensitive assumptions.
DCF=∑((1+r)tFCFt)+ (1+r)nTV
Comparable Company Analysis
Compare to similar businesses using P/E, EV/EBITDA, P/S ratios.
Easy, uses real data, Intuitive valuation.
Distorted conditions, comparables hard to find.
Based on multiples like P/E ratio, specific to industry
Book Value
Based on the company's assets - liabilities recorded on the balance sheet
Useful for tangible asset companies like utilities
Ignores future earning potential, not suitable for companies with high intangible value.
Book Value = Total Assets - Total Liabilities
Reverse DCF
Reverse DCF determines implied growth rate from current valuation.
Reveals market expectations for growth.
Relies heavily on the accuracy of input assumptions.
Market Value=∑((1+r)tFCFt)+(1+r)nTV

Google VALUATION MODEL

MODEL TEMPLATE BUILT BY

ASWATH DAMODARAN

VALUATION MADE BY

BOJAN RADOJICIC

INPUTS

Country of incorporation	United States
Industry (US)	Software (Internet)
Industry (Global)	Software (Internet)
Revenues	$ 297,132
Operating income or EBIT	$ 78,756
Interest expense	$ 329
Book value of equity	$ 256,144
Book value of debt	$ 27,679
Cash and Marketable Securities	$ 113,762
Cross holdings and other non-operating assets	$ -
Minority interests	$ -
Number of shares outstanding	12431.00
Current stock price	$ 140.00
Effective tax rate	14.93%
Marginal tax rate	15.00%
The value drivers below:	
Revenue growth rate for next year	**17.00%**
Operating Margin for next year	**25.00%**
Compounded annual revenue growth rate - years 2-5	17.00%
Target pre-tax operating margin (EBIT as % of sales in year 10)	15.00%
Year of convergence	7.00
Sales to capital ratio (for computing reinvestment)	1.75
Market numbers	
Riskfree rate - US T. Bond (10-year)	3.88%
Initial cost of capital	7.32%

OUTPUTS

	Base year	1	2	3	4	5	6	7	8	9	10	Terminal year
Revenue growth rate		17.00%	17.00%	17.00%	17.00%	17.00%	14.38%	11.75%	9.13%	6.50%	3.88%	3.88%
											1,005.31	1,044.32
Revenues	297,132	347,644	406,744	475,890	556,792	651,446	745,098	832,662	908,668	967,768	7	3
EBIT (Operating) margin	26.51%	25.00%	22.14%	20.71%	19.29%	17.86%	16.64%	15.00%	15.00%	15.00%	15.00%	15.00%
EBIT (Operating income)	78,756	86,911	90,065	98,577	107,381	116,330	124,011	124,899	136,300	145,165	150,798	156,648
Tax rate	14.93%	14.93%	14.93%	14.93%	14.93%	14.93%	14.94%	14.96%	14.97%	14.99%	15.00%	15.00%
EBIT(1-t)	**66,998**	**73,935**	**76,618**	**83,860**	**91,349**	**98,962**	**105,479**	**106,217**	**115,893**	**123,411**	**128,178**	**133,151**
- Reinvestment		28,910	33,825	39,575	46,303	54,175	53,601	50,116	43,501	33,825	21,491	70,577
FCFF	77,618	45,025	42,793	44,284	45,046	44,787	51,878	56,100	72,392	89,585	106,687	62,574
Cost of capital		7.32%	7.32%	7.32%	7.32%	7.32%	7.32%	7.32%	7.32%	7.32%	7.32%	7.32%
Cumulated discount factor		0.9318	0.8682	0.8090	0.7538	0.7024	0.6545	0.6099	0.5683	0.5295	0.4934	
PV(FCFF)		**41,954**	**37,154**	**35,827**	**33,957**	**31,459**	**33,955**	**34,214**	**41,138**	**47,436**	**52,639**	

VALUATION

Terminal cash flow	62,574
Terminal cost of capital	7.32%
Terminal value	1,819,006
PV(Terminal value)	897,486
PV (CF over next 10 years)	389,734
Sum of PV	1,287,220
Probability of failure =	5.00%
Proceeds if firm fails =	283,823
Value of operating assets =	1,237,050
- Debt	27,679
- Minority interests	0
+ Cash	113,762
+ Non-operating assets	0
Value of equity	1,323,133
- Value of options	0
Value of equity in common stock	1,323,133
Number of shares	12,431
Estimated value /share	106.4
Price	140.0
Price as % of value	131.53%

HIGHLIGHTS

ESTIMATED VALUE/SHARE: 106 < MARKET PRICE: 140

80 91 106 125 140 150

MY VALUATION ZONE — MARKET PRICE

DIAGNOSTICS

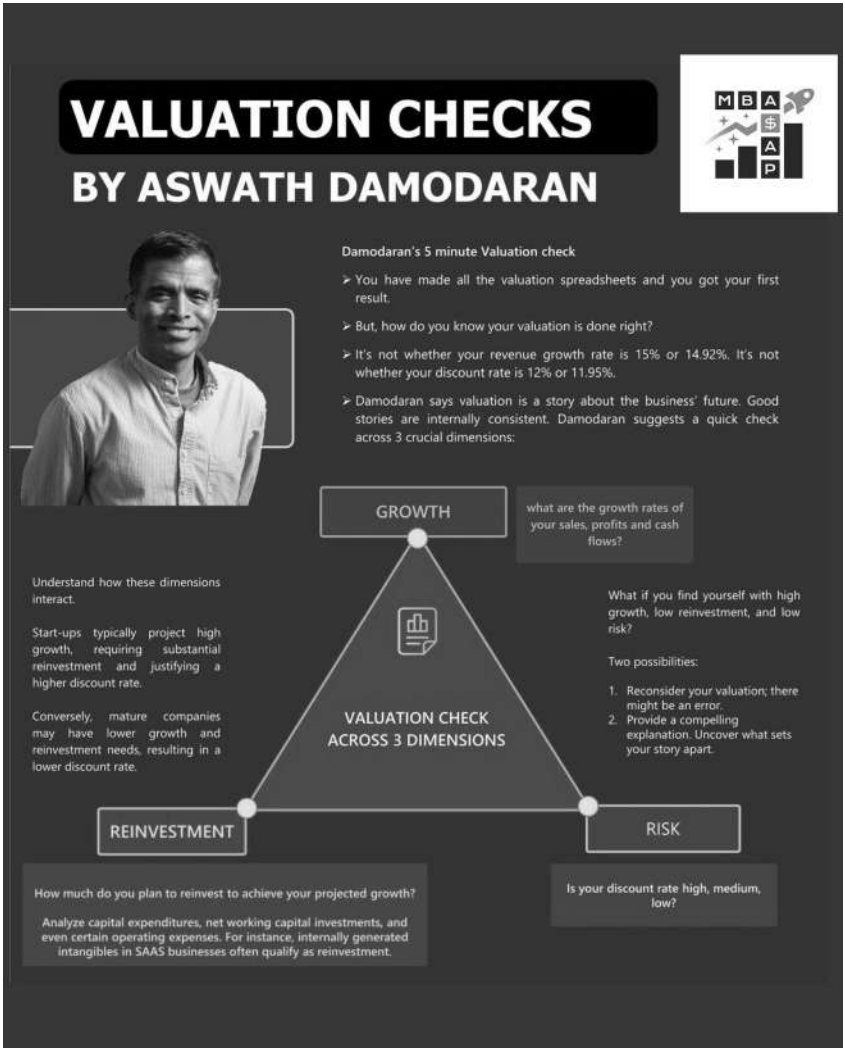
Invested capital at start of valuation	$ 170,061.00
Invested capital at end of valuation	$ 575,364.69
Change in invested capital over 10 years	$ 405,323.69
Change in EBIT*(1-t) (after-tax operating income) over 10 years	$ 72,041.54
Marginal ROIC over 10 years	17.77%
ROIC at end of valuation	22.28%
Average WACC over the 10 years (compounded)	7.32%
Your calculated value as a percent of current price	76.03%

SUMMARY

Year	After-Tax Operating Income	Change in Revenues	Sales to Capital	Reinvestment	FCFF	Capital Invested	Implied ROC
TTM	66,998					170,061	39.40%
1	73,935	50,512	1.75	28,910	45,025	198,971	37.16%
2	76,618	59,100	1.75	33,825	42,793	232,797	32.91%
3	83,860	69,146	1.75	39,575	44,284	272,372	30.79%
4	91,349	80,901	1.75	46,303	45,046	318,675	28.67%
5	98,962	94,655	1.75	54,175	44,787	372,850	26.54%
6	105,479	93,652	1.75	53,601	51,878	426,451	24.73%
7	106,217	87,564	1.75	50,116	56,100	476,567	22.29%
8	115,893	76,005	1.75	43,501	72,392	520,068	22.28%
9	123,411	59,100	1.75	33,825	89,585	553,894	22.28%
10	128,178	37,549	1.75	21,491	106,687	575,385	22.28%

SENSITIVITY

$	WACC								
106.44	5.32%	5.82%	6.32%	6.82%	7.32%	7.82%	8.32%	8.82%	9.32%
10.00%	113.09	109.97	106.97	104.07	101.28	98.58	95.97	93.46	91.03
11.00%	113.93	110.79	107.76	104.84	102.01	99.29	96.66	94.13	91.68
12.00%	114.77	111.60	108.55	105.60	102.75	100.01	97.35	94.79	92.32
13.00%	115.62	112.42	109.34	106.36	103.49	100.72	98.04	95.45	92.97
14.00%	116.46	113.23	110.12	107.12	104.23	101.43	98.73	96.13	93.61
15.00%	117.30	114.05	110.91	107.88	104.96	102.14	99.42	96.80	94.26
16.00%	118.14	114.86	111.70	108.65	105.70	102.86	100.11	97.47	94.91
17.00%	118.99	115.68	112.49	109.41	106.44	103.57	100.80	98.13	95.55
18.00%	119.83	116.49	113.28	110.17	107.18	104.28	101.49	98.80	96.20
19.00%	120.67	117.31	114.06	110.93	107.91	105.00	102.18	99.47	96.85
20.00%	121.51	118.12	114.85	111.70	108.65	105.71	102.87	100.14	97.49
21.00%	122.36	118.94	115.64	112.46	109.39	106.42	103.56	100.80	98.14
22.00%	123.20	119.75	116.43	113.22	110.12	107.14	104.25	101.47	98.78
23.00%	124.04	120.57	117.22	113.98	110.86	107.85	104.94	102.14	99.43
24.00%	124.88	121.38	118.00	114.74	111.60	108.56	105.63	102.81	100.08


VALUATION CHECKS
BY ASWATH DAMODARAN
Damodaran's 5 minute Valuation check
You have made all the valuation spreadsheets and you got your first result.
But, how do you know your valuation is done right?
It's not whether your revenue growth rate is 15% or 14.92%. It's not whether your discount rate is 12% or 11.95%.
Damodaran says valuation is a story about the business' future. Good stories are internally consistent. Damodaran suggests a quick check across 3 crucial dimensions:
GROWTH
what are the growth rates of your sales, profits and cash flows?
Understand how these dimensions interact.
Start-ups typically project high growth, requiring substantial reinvestment and justifying a higher discount rate.
Conversely, mature companies may have lower growth and reinvestment needs, resulting in a lower discount rate.
VALUATION CHECK ACROSS 3 DIMENSIONS
What if you find yourself with high growth, low reinvestment, and low risk?
Two possibilities:
1. Reconsider your valuation; there might be an error.
2. Provide a compelling explanation. Uncover what sets your story apart.
REINVESTMENT
How much do you plan to reinvest to achieve your projected growth?
Analyze capital expenditures, net working capital investments, and even certain operating expenses. For instance, internally generated intangibles in SAAS businesses often qualify as reinvestment.
RISK
Is your discount rate high, medium, low?

CHAPTER 15
BETA

WE WANT to measure how a particular stock changes the risk of our portfolio. That measurement is called Beta. Remember, **volatility is our measure of risk.**

> **Beta tells us how much the stock moves up and down with the market.**

We're going to measure the **variance** of the stock, and we're also going to calculate **covariance**. Covariance is how two things vary together.

If two stocks tend to move together, they've got high covariance. On the other hand, if two stocks vary independently, they don't matter to each other; there's little or no covariance between them.

The more they move together, the more covariance there is.

Covariance is the measure of how things move together. Variance is a measure of how something moves by itself.

Now I am going to introduce the **risk measurement called Beta**.

Beta measures an individual stock's risk contribution to a portfolio.

> **Beta is a ratio of covariance and variance where we divide one by the other. Beta is covariance divided by variance.**

Beta measures an individual stock's volatility relative to the market's volatility. **A stock with a beta of precisely 1.0 means it moves in lock-step with the market.** If the stock's Beta is less than 1.0, it moves less than the market.

If a stock moves more than the market, the stock's Beta is greater than 1.0.

Investing is all about **risk vs. return**. A **quantitative way of assessing risk** gives us a tool to evaluate the returns we require or expect.

High-beta stocks are considered riskier but provide higher returns. Conversely, low-beta stocks pose less risk but also have lower yields. It's a tradeoff.

HOW MUCH DOES A STOCK MOVE WITH THE MARKET?

Here is the formula for calculating Beta.

Beta coefficient(β) = Covariance(Re ,Rm) / Variance(Rm)

where:

Re =the return on an individual stock

Rm=the return on the overall market

Covariance = how changes in a stock's returns relate to changes in the stock market's returns.

Variance = how far the market's data points vary from their average value.

The **covariance** between our stock, Re, and the market, Rm, is the numerator. Covariance measures how much the individual stock we are interested in moves relative to the overall market.

We scale our covariance measure **by the variance** of how much the market moves overall.

That ratio of the variation of the individual stock relative to the variation of the stock market (covariance) divided (scaled) by the overall market variance is called **Beta**, or the beta coefficient.

Beta quantifies an individual stock's unsystematic risk compared to the entire market's systematic risk.

Systematic risk refers to the risk built in to the entire market. Systematic risk is undiversifiable risk as it can't be diversified away.

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Beta is a statistical measurement. We can also calculate Beta by plotting the returns over time of the individual stock against the performance of the market. Beta is the slope of the regression line through those data points.

The good news is that **Beta is calculated for you** and is available as part of the general information about any stock on Google or Yahoo Finance or your favorite place to look up stocks.

You need to know that Beta measures how much a stock moves relative to all stocks scaled by how the market varies overall.

That is a stock's Beta. It's a measure of how much it moves with the market.

Beta measures a stock's risk when we include it in a portfolio.

If I put a particular stock into my portfolio, does that make my collection vary more or less?

Betas are usually around one. They can go as low as 0.25 and as high as 2.5. That is the range.

Beta tells us how much market risk we take when buying a stock.

LET'S LOOK AT AN EXAMPLE.

If a stock has a beta of 2.0, that stock varies in price twice as much as the market. That stock is two times as risky as the market. We will require two times the market premium to buy that stock.

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Two times the market risk should also produce much higher returns.

Let's think about the cost of equity. The cost of equity capital is how much of a rate of return investors require to invest in the company stock.

The rate of return was the risk-free rate plus a risk premium. Recall our estimate of the overall stock market risk premium, which was 5.5%.

Now, we can think about and quantify the risk premium for individual stocks. That risk premium is Beta. So the risk premium for a stock asks: how much market risk am I taking? Beta, times the equity premium, the 5.5% of market risk. The risk premium of a stock with a Beta of 2.0 is 2 * 5.5 = 11%

Beta measures how many portions of market risk a stock represents.

The overall stock market risk premium, which we estimate as 5.5%, equals one portion of market risk.

CHAPTER 16
THE CAPITAL ASSET PRICING MODEL (CAPM)

INTRODUCTION

In finance, the Capital Asset Pricing Model (CAPM) stands as a cornerstone, offering a systematic approach to evaluating risk and predicting investment returns. This exploration of CAPM sheds light on its intricacies and practical applications, culminating in a compelling case study.

DECODING CAPM

At its core, CAPM revolves around the concept of **beta**, a statistical measure that compares the volatility of an individual stock against the broader market. This model ingeniously combines beta with the risk-free rate (often the yield of U.S. Treasury bonds) and the equity premium to predict the expected return on equity.

• **Risk-Free Rate**: This component of the CAPM formula represents the return expected from a completely risk-free investment, typically hovering around 4%.

• **Beta**: As the heart of CAPM, beta quantifies a stock's relative volatility. A beta of 1 suggests that the stock's price movements are in lockstep with the market. A higher beta denotes greater risk and potential for volatility.

• **Equity Premium**: This is the additional return investors anticipate over the risk-free rate for taking on the higher risk of investing in the stock market, estimated at 5.5%.

THE CAPM FORMULA

The essence of CAPM is encapsulated in a simple yet powerful formula:

Required Return = Risk-Free Rate + (Beta × Equity Premium).

This formula stands as a guide for investors in their quest to make informed and quantified decisions.

A CASE STUDY: NAVIGATING HIGH BETA WATERS

Imagine a stock with a beta of 1.7, suggesting it's more volatile than the overall market. Applying the CAPM formula:

- Risk-Free Rate: 2%
- Beta: 1.7
- Equity Premium: 5.5%
- The CAPM result is 11.35% - the expected rate of return for braving the turbulent waters of this high-beta stock.

CAPM'S ROLE IN DISCOUNTED CASH FLOW ANALYSIS

CAPM's influence extends into the realm of Discounted Cash Flow (DCF) analysis. Here, the CAPM-derived rate transforms into the discount rate, which is vital for determining the present value of an

asset's future cash flows.

- **Discounting the Future**: Future cash flows, like stock dividends or property rental income, are discounted back to their present value using the CAPM rate.
- **Terminal Value Considerations**: DCF often incorporates a terminal value beyond a certain period (e.g., 5 years), reflecting the asset's continuing value.

PRACTICAL IMPLICATIONS AND CONCLUSION

In the realm of investments, CAPM plays a critical role. It assists investors in evaluating stocks, helping to ascertain if the expected returns justify the associated risks. Moreover, it aids in crafting diversified portfolios that align with an investor's risk appetite and return expectations.

In conclusion, grasping CAPM's nuances can give investors and finance professionals a distinct edge.

Far from being a mere theoretical construct, CAPM offers a pragmatic lens through which to view and evaluate investment opportunities, striking a balance between risk and potential reward.

With its blend of simplicity and depth, this model is an indispensable tool in the arsenal of anyone looking to navigate the financial markets with confidence and understanding.

CHAPTER 17
HOW TO CREATE A DIVERSIFIED STOCK PORTFOLIO

HARNESS THE POWER OF BETA AND THE CAPITAL ASSET PRICING MODEL.

THE STOCK MARKET has been the greatest wealth generator of the past century. So, with that in mind, the surest way to become wealthy is to save money and invest it in the stock market.

Here are two tools you should be familiar with to reduce risk and increase your returns through diversification and portfolio theory.

Beta and the Capital Asset Pricing Model (CAPM) are used to calculate the cost of equity. CAPM is a method to derive a meaningful discount rate for discounting future cash flows and value income-producing assets.

Attention Entrepreneurs

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Entrepreneurs and investors can use these tools to create a rational valuation for a startup seeking early-stage equity financing.

Let's take a look.

BETA AND CAPM

Every company has different products and services, customers and competitors, technologies, and employees. These unique circumstances and situations mean that every company listed on the stock market has a different risk profile.

How can we measure and compare the relative risks of different stocks?

The equity risk premium is the excess return investors in the stock market require above and beyond the interest rate provided by U.S. treasury bonds. U.S. Treasury bonds are the de facto risk-free alternative because they are backed by the government's ability to pay.

Investors think in terms of a risk-reward tradeoff. The additional anticipated return compensates investors for taking on the higher risk of investing in stocks.

The stock risk premium is a theoretical estimate. It can't be known precisely. No one knows how stocks will perform going forward.

We can estimate the risk premium by measuring past stock market performance.

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Markets compensate investors for taking on the higher risk of investing in stocks.

Estimates of the equity premium vary. A reasonable estimate of the equity premium is around 5.5%. That premium compensates us for putting our money in the stock market instead of a treasury bond.

But what if we invest in the stock of an individual company? What if we put our money in shares of Apple, Goldman Sachs, or Tesla? What rate of return should we expect to invest our hard-earned money in a single company's stock?

Individual stocks are riskier than investing in the overall stock market. That is why mutual funds and ETFs are so popular. They mirror the entire market or sectors of it.

We need to determine the premium to compensate us for taking on the additional risk. We need to measure individual stock risk and price that risk.

Our estimate for the annual average overall stock market return is 5.5%. We need a way to think about and measure the risk of individual stocks to calculate the risk premium required for investing in that stock.

How much risk premium should we expect to compensate us for investing in a specific stock? How do we measure how risky that stock is?

• • •

Let's consider what makes a stock risky. Stocks are volatile. Volatility is another way of saying that their price fluctuates up and down a lot. We can't predict the future. We never know if a stock will go up or down in the short term.

The short-term movement of a stock is a random walk. It may jump around more than the average share. One day, it's up 15%; the next, it goes down 25%.

We can evaluate a stock's past performance to understand the stock-specific risk. For example, we can see how much the share price has varied in their prior performance.

We aren't limited to investing in only one specific stock. Instead, we can invest in many different stocks with different risk profiles. Holding a bunch of various commodities is called a portfolio.

Some of the various stocks go up while others drop, and vice versa.

Think of investing in a suntan lotion company and an umbrella company. When the sun is shining, people buy suntan lotion, and that stock performs well.

But few people are buying umbrellas, and that stock languishes. When it rains, the umbrella company makes sales, and that stock soars. But the suntan lotion company is quiet.

The two companies perform the opposite. Each offsets some of the risks of the other.

• • •

Umbrellas and suntan lotion are simplified examples that illustrate the concept of diversification. Investing in different stocks creates diversification that reduces portfolio risk.

I might require a 20% return to hold a risky stock. However, some other investors might be willing to accept less than a 20% return because they will place the stock in a diversified portfolio. As a result, the company will raise money from the investor, requiring the cheaper required rate of return. From the company's perspective, that is a less expensive cost of capital.

QUANTIFYING DIVERSIFICATION

To take advantage of the risk-reduction qualities of holding a portfolio, we want to measure how diversification affects the risk of a single stock in our portfolio.

Consider the following example, which employs the historical returns on three equities over five years. We want to measure how diversification affects the risk of a single stock in our portfolio.

Consider the following example, which employs the historical returns on three equities over five years: A, B, and C.

Imagine we are looking at the graphs of these three stocks. You know those squiggly lines that chart the movement of a stock over time? You can see them when you look up a company on Google Finance.

• • •

Company A goes up the most at 21% a year, plus or minus 27%. That's a lot of volatility.

B is the middle stock and goes up, on average, 15% a year over five years, plus or minus around 19%. It goes up less and is less volatile.

C has been lackluster over the last five years and hasn't had high returns. It has gone up 5% on average over the previous five years, plus or minus around 17%.

By analyzing the individual returns and volatility, in terms of risk premium, we should charge A the most, we should charge B the middle, and C the lowest risk premium.

But what if we put all three together in a diversified portfolio? What risk premium would I require for the collection?

The three stocks together average out to a smoother line. Let's say the total curve goes up at around 12% plus or minus 10%.

The aggregate line is smoother than any of the three individual lines.

By owning those stocks together in one portfolio, the wiggles in the lines tend to cancel each other out. This smoothing phenomenon is due to the diversification of the portfolio.

Let's return to the umbrella company and a suntan lotion company to reinforce the concept of diversification. The umbrella company does well when it's raining, and the suntan company languishes. When it is

sunny, the suntan lotion company sells products, and the umbrella company is stagnant. Each cancels out the other, and the two together are less volatile than either by itself. That is the risk-hedging impact of diversification.

In our case, sometimes A goes up a lot when B goes down. Sometimes stock C goes up when B and A go down. The mutual cancellation of each independent variation creates a smoother group price line.

That's what we seek as investors. We want to earn a smooth return without being concerned about the market's ups and downs.

Through diversification, the variations in individual stock price movements cancel each other out. That helps us be more comfortable putting our hard-earned money into risky securities like stocks.

The more those variations cancel each other out, the lower the return we require for an individual stock.

We want a quantitative measure of how each stock contributes to the portfolio variation.

Does a stock make the overall portfolio more or less volatile? It doesn't depend on the individual stock wiggles but on how much it varies with the other stocks in our portfolio.

That's a key concept. The risk of a stock comes from how much it impacts the other stocks in our portfolio. So, holding multiple equities can reduce overall risk.

. . .

Why not hold lots of stocks? Why not invest in a portfolio representing the whole market? That is what mutual funds and ETFs are. They are baskets of stocks representing an industry sector or the entire market.

Let's examine how to measure the risk of an individual stock. Volatile variations and jumps could be helpful if that stock wiggles and jumps independently of all the other stocks in our portfolio. We are looking for stocks that zig when our other stocks zag.

We want to measure how a particular stock changes the risk of our portfolio. For example, how do the stock's price movements make the portfolio price movements vary? Does the stock make our collection more or less volatile?

BETA

We want to measure how a particular stock changes the risk of our portfolio. That measurement is called Beta. Remember, volatility is our measure of risk.

Beta tells us how much the stock moves up and down with the market.

We're going to measure the variance of the stock, and we're also going to calculate covariance. Covariance is how two things vary together.

If two stocks tend to move together, they've got high covariance. On the other hand, if two stocks vary independently, they don't matter to each other; there's little or no covariance between them.

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The more they move together, the more covariance there is.

Covariance is the measure of how things move together. Variance is a measure of how something moves by itself.

Now I am going to introduce the **risk measurement called Beta**.

Beta measures an individual stock's risk contribution to a portfolio.

Beta is a ratio of covariance and variance where we divide one by the other. Beta is covariance divided by variance.

Beta measures an individual stock's volatility relative to the market's volatility. A stock with a beta of precisely 1.0 means it moves in lock-step with the market. If the stock's Beta is less than 1.0, it moves less than the market.

If a stock moves more than the market, the stock's Beta is greater than 1.0.

Investing is all about risk vs. return. A quantitative way of assessing risk gives us a tool to evaluate the returns we require or expect.

High-beta stocks are considered riskier but provide higher returns. Conversely, low-beta stocks pose less risk but also have lower yields. It's a tradeoff.

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How much does a stock move with the market?

Here is the formula for calculating Beta.

Beta coefficient(β) = Covariance(Re ,Rm) / Variance(Rm)

where:

Re =the return on an individual stock

Rm=the return on the overall market

Covariance=how changes in a stock's returns relate to changes in the stock market's returns.

Variance=how far the market's data points vary from their average value.

The **covariance** between our stock Re, and the market, Rm, is the numerator. Covariance measures how much the individual stock we are interested in moves relative to the overall market.

We take our covariance measure and scale it by the variance of how much the market moves overall.

That ratio of the variation of the individual stock relative to the variation of the stock market (covariance) divided (scaled) by the overall market variance, is called **Beta**, or the beta coefficient.

Beta quantifies an individual stock's unsystematic risk compared to the entire market's systematic risk.

Systematic risk refers to the risk built-in to the entire market. Systematic risk is an undiversifiable risk as it can't be diversified away.

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Beta is a statistical measurement. We can also calculate Beta by plotting the returns over time of the individual stock against the performance of the market. Beta is the slope of the regression line through those data points.

The good news is that Beta is calculated for you and is available as part of the general information about any stock on Google or Yahoo finance or your favorite place to look up stocks.

You need to know that Beta measures how much a stock moves relative to all stocks scaled by how the market varies overall.

That is a stock's Beta. It's a measure of how much it moves with the market.

Beta measures how risky a stock is when we include it in a portfolio.

If I put a particular stock into my portfolio, does that make my collection vary more or less?

Betas are usually around one. They can go as low as 0.25 and as high as 2.5. That is the range.

Beta tells us how much market risk we are taking when buying a stock.

Let's look at an example.

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If a stock has a beta of 2.0, that stock varies in price twice as much as the market. Therefore, that stock is two times as risky as the market. We will require two times the market premium to buy that stock.

Two times the market risk should also produce much higher returns.

Let's think about the cost of equity. The cost of equity capital is how much of a rate of return investors require to invest in the company stock.

The rate of return was the risk-free rate plus a risk premium. Recall our estimate of the overall stock market risk premium was 5.5%.

Now we can think about and quantify the risk premium for individual stocks. That risk premium is Beta. So the risk premium for a stock is: how much market risk I'm taking, Beta, times the equity premium, the 5.5% of market risk. The risk premium of a stock with a Beta of 2.0 is 2 * 5.5 = 11%

Beta measures how many portions of market risk a stock represents. The overall stock market risk premium, which we estimate as 5.5%, is equal to one portion of market risk.

CAPM

We can put it all together in the **Capital Asset Pricing Model CAPM**.

CAPM describes the relationship between systematic risk, the risk that creating a portfolio can't diversify away, and the expected return for individual stocks.

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CAPM says the *required* or expected rate of return of any asset equals the risk-free rate, plus beta times the Equity Premium.

RRoR = Rrf + B * EP

Where:

EP is the Equity Premium (the expected rate of return from the market above the risk-free rate)

B is Beta (Covariance / Variance)

Rrf is the Risk-Free Rate (U.S. Treasury Bonds)

RRoR is the Required Rate of Return

CAPM is a formula for measuring the risk and the required return on any stock. Every stock has a unique beta. We can calculate that Beta or look it up on Yahoo.

We can say what the return is we require on that stock. Our required rate of return is the risk-free rate plus beta times the equity premium.

Let's calculate an example for a stock with a beta of 1.7. The equity premium is around 5.5%, and the risk-free rate is 2%. How would we calculate the cost of equity for that stock?

It's the risk-free rate, plus beta times the equity premium. In this case, that would be 2% + 1.7 times the 5.5% equity premium, which equals 11.35%.

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So if we buy that stock, how much do we expect to earn for taking that much risk? We plan to receive over 11% for a stock with a beta of 1.7.

Now we have a number. ***We can use that as the discount rate to discount our estimates of the future cash flows to equity holders.***

If we look at the company's balance sheet, we see assets on the left-hand side. On the right-hand side of the balance sheet are debt and equity.

We now have a discount rate that we can apply to discount the company's cash flows.

That discount rate is calculated using the capital asset pricing model, the risk-free rate plus beta times the market premium.

From the Cash Flow Statement, we can calculate Free Cash Flow. Then we can estimate the growth of future free cash flows and discount that income stream to present value with our CAPM calculated discount rate.

We use Net Present Value calculations to use that discount rate to discount estimated future cash flows to present value.

Summary

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Diversification changes risk. Market risk can't be diversified away.

We use an estimate of 5.5% in these examples, but you can modify that to meet your risk profile. Beta measures a stock's sensitivity to that market risk.

When we put those two things together, the risk-free rate plus beta times the equity premium, we have a way to measure the risk of owning individual stocks. And we can use that measure of risk as a discount rate to calculate the present value of a stock. Then, finally, we compare our present value calculation with the market price and conclude whether or not it is worth investing in.

CHAPTER 18
BONDS

INTRODUCTION TO CORPORATE BONDS

IN THE REALM of financial instruments, bonds are paramount. They offer a different avenue for raising capital compared to the commonly known method of issuing equity or stock. Understanding bonds and their role in finance begins with understanding the foundational concepts of assets, equity, liabilities, and the desire of a business to expand.

UNDERSTANDING THE BASICS OF ASSETS AND EQUITY

Imagine a company with assets totaling $10 million. In a simplified scenario with no liabilities, the entire value of these assets, $10 million, belongs to the company's owners. This value is referred to as the owner's equity. If this equity is distributed over a million shares, each share's worth is $10.

THE DRIVE TO EXPAND: EQUITY VS. DEBT FINANCING

Suppose this company plans to expand its assets by an additional $5

million to purchase a new factory. The pivotal question then arises: How should the company finance this expansion?

Equity Financing: One route the company could take is to issue more equity. If the company's shares are valued at $10 each, they could release an additional 500,000 shares at this price. By doing this, the company raises the required $5 million, but at the cost of diluting the ownership. This scenario means there are now more shareholders to divide the company's profits.

Debt Financing: An alternative to issuing more equity is borrowing the money. Instead of issuing shares, the company could acquire a loan of $5 million, adding this as a liability to their balance sheet. The significant difference here is that lenders don't share in the company's profits, unlike shareholders. Instead, they are paid interest on the money they've lent. This interest is treated as an expense for the company. The debt holders only receive their predetermined interest, regardless of how well the company performs.

INTRODUCING BONDS

If a company decides not to borrow from a single entity, like a bank, it could borrow from multiple entities by issuing bonds. A bond is a certificate that denotes a loan. It has a face (or par) value, often set at a standard like $1,000, and specifies an interest rate known as the "coupon."

Historically, bonds would come with physical coupons attached, which the bondholder would detach and present to receive their interest payment. Though the process is now electronic, the term "coupon" remains. Also, bonds have a maturity date, indicating when the bond issuer will repay the bond's principal amount.

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Using the example of the company seeking $5 million, they could issue 5,000 bonds with a face value of $1,000 each. If an individual purchases one of these bonds, they lend the company $1,000. In return, they receive interest payments, typically semi-annually, based on the bond's coupon rate. Once the bond reaches maturity, the bondholder receives their final interest payment and the original principal amount they invested.

BOND PAYMENTS STRUCTURE

Consider a bond with a 10% annual coupon that matures in two years. A bondholder would receive semi-annual payments of $50 (half of the 10% of $1,000) for the bond's duration. At the bond's maturity, they'd receive the final $50 interest payment plus the original $1,000 they invested.

When many bonds mature simultaneously, a company might need to issue new bonds to repay the older ones if they haven't generated enough revenue from their investments, such as the new factory in our example.

Conclusion

Bonds offer an alternative method for companies to raise capital without diluting ownership. They exemplify the diverse strategies companies can employ to finance their growth and ambitions. This flexibility in financing options is essential in the ever-evolving landscape of capital markets and business expansion.

THE BOND MARKET

Bonds and bank loans form what is known as the credit market. The global credit market, in aggregate, is **about three times the size of the global equity market**.

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The size of the bond market relative to the stock market is an interesting aspect of global finance, and it tends to surprise many people who are more familiar with the more frequently publicized stock markets.

1 Overall Size: Globally, the bond market is larger than the stock market. This size difference is primarily because the bond market encompasses a vast range of debt instruments issued by governments, municipalities, and corporations worldwide.

2 Government and Corporate Bonds: A significant portion of the bond market is government bonds, such as U.S. Treasuries, which are issued to finance government spending. Corporate bonds, issued by companies to raise capital, also make up a large portion of the market. These large pools of debt instruments make the bond market larger than the stock market.

3 Stock Market Visibility: Despite its size, the bond market is less visible to the general public than the stock market. The stock market tends to capture more media attention due to its volatility and the public's familiarity with stocks and stock exchanges. Moreover, many people are more likely to invest directly in stocks than in bonds.

4 Market Dynamics: The bond market dynamics differ from those of the stock market. Bonds are generally considered a lower-risk investment compared to stocks, as they provide fixed interest payments and return the principal at maturity. In contrast, stocks are equity investments that offer higher potential returns but with greater risk, including the risk of losing the entire investment.

5 Economic Indicators: The bond market is often a key indicator of economic conditions. For example, government bond yields can reflect investor expectations about inflation and central bank policy. In contrast, the stock market typically reflects corporate profitability and investor sentiment towards specific companies or sectors.

6 Liquidity: While the stock market is generally more liquid with more frequent buying and selling, the bond market, especially for certain types of bonds like municipal or corporate bonds, can be less liquid.

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In summary, the bond market's larger size reflects the extensive range of debt instruments globally, its critical role in financing government and corporate activities, and its appeal as a lower-risk investment option.

INVESTING BASICS: BONDS - A COMPREHENSIVE OVERVIEW

While a prevalent investment tool, bonds often remain enigmatic to many investors. The essence of bonds lies in their fundamental definition: a loan extended to either a corporate entity or a government by an investor. By issuing a bond, these entities acquire funds from investors, who, in reciprocation, receive interest on their lent money. The predominant motivations behind issuing bonds include sourcing funds for novel projects or acquisitions.

A primary allure of bonds for investors is twofold: they offer a potential avenue to preserve their capital and simultaneously generate an additional income stream. When juxtaposed with stocks, bonds are traditionally perceived as a more secure investment option. They are frequently used to diversify investment portfolios, mitigating risks and enhancing potential returns.

CASE STUDY: MUNICIPAL BOND FINANCING

To elucidate, consider a hypothetical scenario. Suppose a city named Fairview contemplates constructing a new baseball stadium and resolves to issue bonds to generate the required capital. Each bond, priced at $1,000, embodies a loan that Fairview commits to repay over a decade.

To enhance its appeal to potential investors, an annual interest rate (or coupon rate) of 5% is attached to the bond. An investor procuring the

bond at its face value would receive a yearly payout of $50, continuing for the bond's entire ten-year duration.

Upon maturity, the initial investment amount, the principal, is returned to the investor. In this example, both parties benefit: Fairview acquires the necessary funding, while the investor enjoys consistent interest payments and eventually recovers the initial investment.

The structured, periodic payments associated with bonds render them a predictable and stable investment. This consistency contrasts with stocks, where market-driven fluctuations can make returns more volatile and less foreseeable.

BOND RISK

However, it's crucial to understand that, like all investments, bonds are not devoid of risks:

1. Default Risk pertains to the possibility of the bond issuer failing to repay the principal amount. The level of this risk predominantly hinges on the issuer's financial robustness. While governmental entities are generally deemed stable and thus offer lower coupon rates, corporate bonds usually come with elevated coupon rates due to the inherent risk of corporate bankruptcies.

2. Interest Rate Risk: This risk emerges when prevailing interest rates rise, potentially reducing the market value of existing bonds if they are to be sold before their maturity. Higher current interest rates divert investors towards newer bonds, rendering existing, lower-yield bonds less attractive unless sold at a discounted rate.

Evaluating a bond's inherent risks can be facilitated by **credit rating agencies** that assess and rank bonds based on the issuer's financial stability. However, investors must undertake comprehensive research rather than solely rely on these ratings, as they are not infallible.

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In conclusion, with their potential for capital preservation and income generation, bonds serve as valuable components of a diversified portfolio.

CHAPTER 19
BOND MATH

BOND VALUES AND INTEREST RATES

THE RELATIONSHIP between bond values and interest rates is a fundamental concept in finance based on the principle that bond prices and interest rates have an **inverse relationship**. Here's an explanation of why this happens:

Fixed Interest Payments: Most bonds pay fixed interest rates, known as coupon rates. You receive regular interest payments based on this rate when you purchase a bond. The bond's face value is repaid when it matures.

Market Interest Rates Change: After a bond is issued, market interest rates can fluctuate due to various factors, including changes in economic conditions, monetary policy, and inflation expectations.

Impact on Bond Prices: When market interest rates rise, newly issued bonds offer higher rates than existing ones. As a result, existing bonds

with lower interest rates become less attractive, causing their market value to decrease. Conversely, when market interest rates fall, existing bonds with higher rates become more valuable, increasing their market price.

Example of Inverse Relationship:

◦ **Interest Rates Increase**: Imagine a bond with a fixed interest rate of 5% trading at its face value of $1,000. If market interest rates rise to 6%, new bonds are issued at this higher rate. Investors will not want to pay $1,000 for the older bond yielding 5% when they can get a new bond with a 6% return for the same price. Therefore, the existing bond's price must decrease to make it more attractive to potential buyers.

◦ **Interest Rates Decrease**: Conversely, if market rates drop to 4%, the existing bond paying 5% becomes more attractive. Investors are willing to pay more than the face value for this bond because its interest rate is higher than what new bonds offer. Hence, the bond's price increases.

Yield to Maturity (YTM): The bond's yield to maturity adjusts as its price changes. When a bond's price falls, its yield increases, reflecting the higher return an investor can earn relative to its lower price. Conversely, when a bond's price rises, its yield falls.

Compensation for Risk: This inverse relationship between bond prices and interest rates also compensates investors for the risk they undertake. When interest rates rise, bondholders are 'stuck' with an asset yielding lower returns than the market rate, hence the price drop. When interest rates fall, bondholders possess an asset yielding higher than the market rate, justifying a price increase.

Understanding this relationship is crucial for issuers and investors, as it affects both the market value of their bond investments and their

decisions regarding buying or selling bonds in response to interest rate movements.

BOND MATH CASE STUDIES

Let's explore two case studies that illustrate bond math, focusing on the impact of changing interest rates on bond prices. These examples will use simplified calculations to clarify the concepts.

Case Study 1: Impact of Rising Interest Rates on a Corporate Bond

Background

• **Bond Issued**: A corporate bond is issued with a face value of $1,000.

• **Coupon Rate**: It has a fixed annual coupon rate of 5%, meaning it pays $50 annually.

• **Market Interest Rate at Issuance**: At the time of issuance, the prevailing market interest rate for similar bonds is also 5%.

Scenario: Market Interest Rate Increases to 7%

• **New Bonds Issued**: New corporate bonds are now being issued with a 7% coupon rate.

• **Old Bond's Appeal Decreases**: The existing bond paying 5% is less attractive because investors can get a 7% return on new bonds.

Bond Price Calculation

• **Desired Yield Matches Market Rate**: Investors now require a 7% yield to match the market rate.

• **Annual Coupon Payment**: $50 (fixed).

• **New Yield Requirement**: 7% of the bond's price.

• **Bond Price Calculation**: The bond's price needs to be such that $50 represents a 7% yield. Using the formula:

Price=NewYield/CouponPayment ,

we calculate the new price:

Price = $50/7% = $50/0.07 = $714.29.

• **Result**: The bond's price decreases from $1,000 to approximately $714.29.

Case Study 2: Impact of Decreasing Interest Rates on a Government Bond

Background

• **Bond Issued**: A government bond is issued with a face value of $1,000.

• **Coupon Rate**: It has a fixed annual coupon rate of 4% or $40 annually.

• **Market Interest Rate at Issuance**: The market interest rate for similar bonds is 4% at issuance.

Scenario: Market Interest Rate Decreases to 2%

• **New Bonds Issued**: New government bonds are now being issued at a 2% coupon rate.

• **Old Bond's Appeal Increases**: The existing bond paying 4% is more attractive because new bonds offer only a 2% return.

Bond Price Calculation

• **Desired Yield Matches Market Rate**: Investors are now looking for a 2% yield.

• **Annual Coupon Payment**: $40 (fixed).

• **New Yield Requirement**: 2% of the bond's price.

• **Bond Price Calculation**: The bond's price needs to be such that $40 is a 2% yield. Using the formula:

$$Price = \frac{CouponPayment}{NewYield},$$

we calculate the new price:

$$\text{Price} = \$40 / 2\% = \$40 / 0.02 = \$2{,}000.$$

• **Result**: The bond's price increases from $1,000 to $2,000.

Conclusion

These case studies illustrate the inverse relationship between bond prices and market interest rates. When interest rates rise, existing bonds with lower rates decrease in value, and when interest rates fall, bonds with higher rates increase in value. This understanding is crucial for bond investors and issuers, particularly in environments where interest rates are volatile.

CHAPTER 20
STOCKS AND BONDS IN CORPORATE FINANCE

IN CORPORATE FINANCE, stocks and bonds are essential instruments companies use to raise capital, manage financial health, and fuel growth. Each plays a distinct yet complementary role in a company's financial strategy.

Stocks

- **Equity Financing**: Issuing stocks allows companies to raise capital without incurring debt. By selling shares, a company trades equity for funding.
- **Ownership and Voting Rights**: Stocks represent ownership in a company. Common stockholders typically have voting rights, influencing corporate governance.
- **Dividends and Capital Appreciation**: While dividends are not guaranteed, they are a way for companies to distribute profits to shareholders. Stock values may increase with the company's performance, offering potential capital gains to investors.
- **Market Dynamics and Investor Relations**: Publicly traded stocks expose companies to market dynamics. A company's stock price can influence its public perception and investor relations, affecting its ability to raise future capital.

• **Risk and Reward Balance**: Stocks involve a higher risk than bonds, as they are subject to market volatility. However, they also offer the potential for higher returns.

Bonds

• **Debt Financing**: Issuing bonds is a way for companies to raise funds through debt. Bonds are loans from investors to the company, with a promise of repayment with interest.

• **Fixed Income**: Unlike stocks, bonds provide a fixed income stream through regular interest payments (coupon payments), offering more predictability and lower risk.

• **Credit Ratings and Interest Rates**: A company's credit rating impacts the interest rates on its bonds. Higher-rated (lower-risk) companies can issue bonds with lower interest rates.

• **Debt Obligations and Financial Health**: Bonds increase a company's debt obligations. Maintaining a manageable level of debt is crucial for a company's financial health and creditworthiness.

• **Maturity and Liability Management**: Bonds have a maturity date by which the principal amount must be repaid. Companies need to manage these liabilities effectively to avoid financial strain.

In corporate finance, the mix of stocks and bonds in a company's capital structure is a critical decision, reflecting its strategy, risk tolerance, and financial goals. Stocks offer a way to raise capital without increasing debt, but they dilute ownership and can be more volatile. Bonds provide a steadier source of funding but increase debt and financial obligations. Balancing these tools effectively is key to sustainable financial management and long-term growth.

CHAPTER 21
Q&A

THESE ARE questions and answers that I initially published on Quora related to Accounting, Financial Statements, Financial Analysis, and Corporate Finance.

ACCOUNTING

WHAT IS THE DIFFERENCE BETWEEN REVENUE AND EBITDA?

Both are Income Statement numbers. Revenue is the top line on the Income Statement. It is the money from sales. EBITDA is what is left from Revenue after expenses have been subtracted. EBITDA stands for Earnings Before Interest Taxes Depreciation and Amortization.

Earnings, Profit, and Net Income are all terms for the same number. They are synonyms.

Here is more information on the Income Statement and how to read one.

INCOME STATEMENT

The Income Statement can be summarized as: Revenues less Expenses equals Net Income. The term Net Income simply means Income (Rev-

enues) ***net*** (less) of Expenses. Net Income is also called Profit or Earnings. Revenues are sometimes called Sales.

You understand this concept intuitively. We always strive to sell things for more than they cost us to make. When you buy a house you hope that it will appreciate in value so you can sell it in the future for more than you paid for it. In order to have a sustainable business model in the long run, the same logic applies. You can't sell things for less than they cost you to make and stay in business for long.

Think of the Income Statement in relation to your monthly personal finances. You have your monthly revenues: in most cases a salary from your job. You apply that monthly income to your monthly expenses: rent or mortgage, car loan, food, gas, utilities, clothes, phone, entertainment, etc. Our goal is to have our expenses be less than our income.

Over time, and with experience, we become better managers of our personal finances and begin to realize that we shouldn't spend more that we make. We strive to have some money left over at the end of the month that we can set aside and save. What we set aside and save is called **Retained Earnings**.

Some of what we set aside we may **invest** with an eye toward future benefits. We may invest in stocks and bonds or mutual funds, or we may invest in education to expand our future earning and working prospects. This is the same type of money management discipline that is applied in business. It's just a matter of scale. There are a few additional zeros after the numbers on a large company's Income Statement but the idea is the same.

This concept applies to all businesses. **Revenues** are usually from Sales of products or services. **Expenses** are what you spend to support the operations: Salaries, raw materials, manufacturing processes and equipment, offices and factories, consultants, lawyers, advertising, shipping, utilities etc. What is left over is the Net Income or Profit. Again: Revenues – Expenses = Net Income. "Your Income needs to be more than your Outflow or your Upkeep is your Downfall." My Mom used to say that. :)

Net income is either saved in order to smooth out future operations and deal with unforeseen events; or invested in new facilities, equip-

ment, and technology. Or part of the profits can be paid out to the company owners, sometimes called **shareholders** or stockholders, as a **dividend**.

The Income Statement is also known as the "profit and loss statement" or "statement of revenue and expense." Business people sometimes use the shorthand term "**P&L**," which stands for profit and loss statement. A manager is said to have "P&L responsibilities" if they run an autonomous division where they make the decisions about marketing, sales, staffing, products, expenses, and strategy. **P & L responsibility** is one of the most important responsibilities of any executive position and involves monitoring the net income after expenses for a department or entire organization, with direct influence on how company resources are allocated.

The terms "profits," "earnings" and "net income" all mean the same thing and are used interchangeably.

Remember: Income (revenue or sales) – Expenses = Net Income or profit

Google the term "income statement" and you will see lots of examples of formats and presentations. You will see there is variety depending on the industry and nature of the business but they all follow these basic principles.

You can download my free ebook on Reading and Understanding Financial Statements on my website http://www.mba-asap.com

WHY DO NET LOSSES REDUCE RETAINED EARNINGS?

This question is a perfect one because it straddles the three financial statements and their impact on each other.

The impact of the Income Statement on the Balance Sheet is a great question that goes to the heart of accounting, financial statements, and financial reporting.

Net profits and net losses are recorded at the end of the period to the Balance Sheet in the Retained Earnings account. That is what retained earnings means. The bottom line of the Income Statement impacts the equity section of the Balance Sheet via Retained Earnings.

Below is a description of how accounting numbers flow through the three financial statements and how they are interconnected.

THE BIG PICTURE OF FINANCIAL STATEMENTS

The three Financial Statements: Balance Sheet, Income Statement, and Cash Flow Statement are interconnected, and the accounting numbers flow through them. They are the measure of a company's performance and health.

The interconnection starts with a Balance Sheet showing the financial position at the beginning of the period (usually a year); next, you have the Income Statement that shows the operations during the year, and then a Balance Sheet at the end of the year.

The Cash Flow Statement is necessary to **reconcile** the cash position starting from the Net Income number at the bottom of the Income Statement.

The cash number calculated from the Cash Flow Statement is added to the cash reported on the beginning Balance Sheet in the Cash account. This number needs to match the actual money in the bank at the end of the period. These steps represent the reconciliation process where you reconcile the cash account number in your accounting software to the actual balance in your bank account.

The reconciled amount is recorded as the Cash account balance at the top right (Asset column) of the end of year (EOY) Balance Sheet.

The Net Income number from the Income Statement (profit or loss) is then added, or subtracted in the case of a loss, to the Retained Earnings number in the Equity section (lower left-hand side) of the end of year (EOY) Balance Sheet. *A profit increases retained earnings, and a loss decreases retained earnings. (This addresses your specific question.)*

Changes in non-cash accounts like Accounts Receivable and Accounts Payable and Depreciation and Amortization will make up the difference between the Cash Flow number added on the right side of the Balance Sheet and the Net Income number added on the left-hand side.

When these steps are performed correctly, all the numbers should

reconcile. The Assets will be equal to the Liabilities and Equity (remember the Accounting Equation A = L + E) on the EOY Balance Sheet.

FINANCIAL STATEMENT INTERCONNECTIONS AND FLOW

Think of it as a system of two Balance Sheets acting as bookends for the Income Statement. The Cash Flow Statement reconciles the Net Income (or Loss) at the bottom of the Income Statement with the amount of cash actually in the bank.

This process accounts for every penny that has come in, gone through, and gone out of a company during the period.

Understanding the three financial statements and how they knit together will allow you to assess the financial health, viability, and prospects of any company, and help you make rational fact-based investment decisions. It's the basis of Value Investing, and this is how Warren Buffett does it.

This post ties together the functionality of the financial statements. I hope this might be an “aha” moment for you. It was for me when I finally realized how this all fit and worked together.

Understanding how to read and understand financial statements is the basis of Financial Literacy and Capitalism. Following this big conceptual picture of accounting will provide a context to keep you from ever getting lost in the details like specific debits and credits.

Suffice it to say one of the greatest thinkers and writers Johann Wolfgang von Goethe called double entry accounting "among the finest inventions of the human mind."

WHY MIGHT A COMPANY HIRE ONE BIG 4 ACCOUNTING FIRM OVER ANOTHER TO AUDIT ITS FINANCIAL STATEMENTS?

There are lots of very good accounting firms that offer corporate auditing services. The Big 4 have consolidated from what used to be called the Big 8. They are the largest accounting firms and have international operations. Choosing one over the other would come down to whether their offices overlap with a companies operations

geographically, price, timing, and whether a CFO feels a comfortable relationship with the accountants handling the audit.

Here is more general information on the role of auditors and the process.

The Role of Auditors

As per the SEC requirements and regulations, in order to be eligible to be traded on a U.S. stock exchange, a publicly traded company's financials must be prepared by the company and then reviewed and audited by an outside Certified Public Accountant (CPA).

What is an auditor?

The auditing process entails reviewing the financial statements prepared and drafted by the company to make sure they conform to GAAP and other rules. The auditors also "test" the numbers by requesting and reviewing supporting documentation such as invoices, checks, bills, and contracts. They send letters to the company's banks to confirm bank balances and contact lawyers the company has worked with to confirm that there are no liabilities or lawsuits pending that have not been disclosed.

The Auditing Process

In a company, performance is paramount. There are strong temptations to commit fraud for personal gain or to make the numbers look better.

People who run companies have the power to exploit financial information for personal gain. For publicly traded companies annual auditing is a legal requirement. The investors of many privately held companies, including their bankers, also require annual audited financial statements.

The audit process is designed to protect against misrepresenting financial information to improve results, avoid taxation, hide fraud, or not report latent liabilities. Audits are a process of gaining information about the financial systems and the financial records of a company.

Financial audits are performed to ascertain the validity and reliability of information, as well as to provide an assessment of the company's internal control system. Audits are carried out by a third party impartial account that is certified as a CPA.

What does it take to be an auditor?

To work on other company's financials you must be a CPA. In the United States a CPA will have passed the Uniform Certified Public Accountant Examination and met additional state education and experience requirements for membership in their state's professional accounting body. You don't have to be a CPA to work for a company internally as an employee in accounting or finance. You can be a CFO and not be a CPA.

Since the auditor cannot feasibly know or discover everything about a company, an audit seeks to provide reasonable assurance that the financial statements are free from material error. Test work and sampling of documents is performed in audits as a way to statistically confirm that the company has done the accounting properly.

A set of financial statements is understood to be 'true and fair' when they are deemed free of material misstatements. The auditor confirms this in their opinion letter that precedes the financials in the presentation. The opinion given on financial statements depends on the audit evidence obtained. You find the opinion letter at the beginning of the audited financial statements.

You can review the audited financial statements of publicly traded companies on the SEC website under the EDGAR tab. Look for the company's most recent 10K filing.

WHAT HAPPENS WHEN AN EXTERNAL AUDITOR QUALIFIES A FINANCIAL STATEMENT WHICH DOES NOT COMPLY TO THE STANDARDS?

A company never wants to get a qualified opinion from their auditors. That means the company did not follow Generally Accepted Accounting Principals GAAP. It can mean poor controls and procedures for accounting, or fraud and cover-up. Its not a good situation.

If the company is publicly traded the regulators like the SEC can remove their listing. If the company is private then the investors, owners, creditors, banks, vendors and others involved with the company may stop doing business with the company or move to remove top management or sue.

A company's ability to keep good records and accounting is critical to maintaining confidence in its ability to operate well.

BY ADOPTING THE COST ACCOUNTING METHOD, CAN A FIRM PREPARE A FINANCIAL STATEMENT?

The short answer is financial statements are not derived from cost accounting accounts.

Cost accounting and financial accounting have different audiences.

Cost accounting is an internal activity for managers. Cost accounting focuses on measuring direct and indirect costs.

What gets measured gets managed, so measure what matters.

Cost accounting measures manufacturing and inventory as Work In Progress (WIP) though all its progressive stages.

This information is proprietary and strategic and not shared with the outside world.

Financial accounting used different accounts. Its end product is the preparation of financial statements.

Financial Statements are for external audiences that have an interest in the company.

Financial statements provide information on the performance of the company. Interested parties are investors, creditors, government agencies, vendors, and others.

It's the same numbers sliced and diced in different ways to meet different ends.

WHAT ARE MONTHLY FIXED COSTS AND UNIT VARIABLE COSTS?

Fixed costs are the costs incurred no matter how many units you sell. For example a Pizzeria needs an oven no matter if it sells zero pizzas or 1,000. Monthly fixed costs are all those costs for the month, or annual costs divided by 12.

Variable costs are the cost of the things that go into the product or service. For a pizza it would be the dough, sauce, and labor to make it. Each pizza is a unit. These costs are a function of how many units you make.

Your total costs are your fixed costs plus your variable costs.

CAN AVERAGE FIXED COST BE ZERO?

There are two kinds of costs in a cost structure: fixed and variable. If all the costs of a product or service are variable, then fixed costs could conceivably by zero. With digital products delivered via the internet the fixed costs can be very small.

HOW DO YOU KNOW IF THE ASSETS LISTED IN THE BALANCE SHEET SHOW THE REAL VALUE?

The assets listed on a balance sheet don't show their current market value. Assets are initially recorded at cost. Then, each year, their cost value is reduced by the depreciation recorded for that year.

For example, if a machine cost $100,000 it will be recorded at $100,000. Then the accountant for the company will estimate its useful life. Say that is 5 years. So each year $20,000 worth of its value will be recorded as an expense in the Income Statement. And that $20,000 will be subtracted from the purchase price on the Balance Sheet as accumulated depreciation. So, its "value" on the Balance Sheet is now $80,000.

The next year another $20,000 is recorded and now the value is $60,000. It is the original cost less accumulated depreciation.

After five years the asset is worth zero on the books even though it may be used for another ten years.

This process shows the difference between the book value of assets and their market value.

FINANCIAL STATEMENTS

WHAT IS THE DEFINITION OF THE TERMS FINANCIAL STATEMENT?

What are financial statements?

There are 3 Financial Statements: Balance Sheet, Income Statement, and Cash Flow Statement. They are the reports that accounting produces. Financial Statements are the end product of accounting.

Financial Statements are the primary language of money and business. Everyone should have a basic understanding of Financial Statements: what they are and what information they provide. It's a competency that can open up opportunities and vistas that are closed off otherwise.

Executives in a company like the CEO, COO, and CFO routinely share and discuss financial data with marketing, operations, and other direct reports and personnel. They also compile and share financial information with stakeholders outside the firm, such as bankers, investors, and the media.

But most people don't understand finance and the numbers. A recent investigation into this question concluded that even most managers and employees don't understand enough to be useful.

THREE MAIN FINANCIAL STATEMENTS

There are three main financial statements, and they are linked together to provide a picture of an enterprise's financial position and health. They represent the end product of accounting, meaning they are the reports generated by accounting covering all of a company's transactions.

The three primary financial statements are the

- **Balance Sheet**: which shows firm's assets, liabilities, and net worth on a stated date
- **Income Statement**: also called profit & loss statement or simply the P&L: which shows how the net income of the firm is arrived at over a stated period, and
- **Cash Flow Statement**: This shows the inflows and outflows of cash due to the firm's activities during a stated period.

Knowing how to read and understand financial statements is a business skill you can't ignore. It can help work your way up the corporate ladder by communicating with others in your company and understanding the big picture. It is also a useful skill to know where your efforts and work can make the most impact.

When you are thinking about possibly changing jobs and working for a company, you can check their financials and make sure they are healthy. If you are considering starting your own company, you will need to have financials prepared by your accountant to talk to investors, bankers, and vendors.

Suppose you want to invest wisely in the stock market, analyze the competition, or benchmark your performance. In that case, you can look up any publicly-traded company's financials at the Securities and Exchange Commission website's' EDGAR filings and get an idea of how they are doing. Check out any public company's most recent 10K filing there. A 10K is the Annual Report of the company and its most important business and financial disclosure document.

WHAT IS THE BALANCE SHEET EQUATION?

The Balance Sheet can be summarized as: **Assets = Liabilities + Equity**. This is called the accounting equation; memorize it. These three *balance sheet* segments give the interested reader an idea as to what a company owns (**assets**) and owes (**liabilities**), and the amount invested and accumulated by the owners or shareholders (**equity**).

The Balance Sheet is a snapshot of the financial position of a company at a particular point in time. It is compiled at the end of the year or quarter. It is a summary of the Assets, Liabilities and Equity.

Think of how your home is financed as simple balance sheet. The **asset** is the value of the house. This is determined by an appraisal or sale. The value of your home varies as the market varies. An appraiser takes into account recent sales in the area and adjusts for differences like an extra bedroom or bathroom. An appraisal also takes into account replacement value; how much would it cost to recreate the house with the current costs for materials and labor. The **liability** is the **mortgage** balance and the **equity** (in this case we call it the home-owner's equity) is the difference between the two.

If the house is worth more than you owe, then you have positive equity. If the mortgage balance is more than the value of the home, then you have negative equity, sometimes called being "upside down" or "underwater".

The same concepts apply to a corporate balance sheet. If the assets are greater than the liabilities then there is positive shareholder's equity. If the liabilities are more than the assets, the company is considered **insolvent**. In this case a company declares bankruptcy.

BALANCE SHEET PRESENTATION

A Balance Sheet is constructed of two basic parts. Assets are listed in a column and totaled at the bottom of the column. Liabilities and Equity are listed in another column with the liabilities section listed above the equity section. Liabilities and Equity are each totaled separately and then together at the bottom. Sometimes these columns are presented in a stacked form with the Asset column on top. And sometimes these columns are presented side by side with the Assets on the left hand side and both Liabilities and Equity on the right hand side.

The Liabilities and Equity show how the Assets are financed. Liabilities and Equity totals in the right hand column must exactly equal the Asset total at the bottom of the left hand column.

When someone talks about the left hand side of the balance sheet, they are referring to assets; if they talk about the right hand side of the balance sheet, they mean liabilities and equity.

For comparison purposes, the Balance Sheet numbers of the previous year are also usually presented next to this year's numbers. Remember the goal of these Financial Statements is to present the financial information in a clear and meaningful way so interested parties can quickly grasp the performance and status of the enterprise.

According to GAAP, the U.S. accounting standard, assets and liabilities are listed in the order of their liquidity, from short term to long term, as you go down the items listed in each column. Cash is the most liquid asset so it is listed on the top left of the Balance Sheet. Long term debt comes after short term debts in the Liability column and Equity is listed below the Liabilities. Equity is listed below Liabilities because shareholders have a junior claim on the assets of the corporation. In case of a bankruptcy or liquidation of the company, the money collected from the sale of assets goes first to pay the lenders. Any

residual money after the lenders are paid off is distributed to the shareholders.

Outsides the United States, the rest of the world presents balance sheet items in the reverse order, from least liquid on top to most liquid at the bottom. The International Accounting Standards are referred to as IAS.

HOW DO YOU CALCULATE THE BOOK VALUE ON A BALANCE SHEET?

The book value of assets is what is reported on the balance sheet. It is the cost of the asset less depreciation. Book value can be a misleading indicator of the value of an asset. The asset may have appreciated in value over the time it has been depreciated on the books. Real estate is a good example.

HOW DO YOU ACQUIRE LEVERAGE?

Leverage is a fancy word for borrowing. Debt is leverage. Leverage is how one buys a house for only 20% equity. Leverage in a business is how much debt is used relative to equity for purchasing assets. It is the right-hand side of the balance sheet.

You usually acquire leverage from a bank in the form of a loan. The bank does credit analysis to gauge whether you can repay the loan. Default is the bank's biggest risk. That means you need to show steady historical income streams that can support the loan payments.

The amount of the income streams relative to the loan payments is called the debt service coverage ratio DSCR.

HOW CAN I CALCULATE THE STOCK VALUE OF MY BUSINESS?

Stock is the value of equity. They are synonyms. It is a balance sheet value. Assets = Liabilities + Equity. So Equity = Assets - Liabilities. That is the value of your stock.

WHAT DO NEGATIVE RETAINED EARNINGS MEAN ON THE BALANCE SHEET?

Negative retained earnings on the Balance Sheet means the company has been reporting net losses on the Income Statement and has chewed through all its equity.

In this situation, the Assets of the company are worth less than its debt and obligations.

It's a situation similar to if you own a house and the appraised value of the house is less than the mortgage.

The company, like the house, is under water.

WHAT MAKES A BALANCE SHEET GOOD OR BAD?

The basic measure of the health of a Balance Sheet is whether the value of Assets is greater than Liabilities. The Accounting Equation is:

Assets = Liabilities + Equity

Shareholders or owners of a company essentially own the Equity. Equity has a positive value if Liabilities are less than Assets.

Think of a Balance Sheet like owning a home. The Asset value is set by an appraisal. The Liability is the mortgage. The Equity in the home is the difference between the two.

HOW DO YOU INCREASE CAPITAL ON A BALANCE SHEET?

A company increases its capital in two ways. It either **1**) makes an operating profit through net income and cash flow, or **2**) it takes on financing by either selling stock or taking on debt.

This increase in cash will show up on the balance sheet as an asset in the cash category. The offsetting entry will be to equity if it is from selling stock, a liability if it is from debt, or retained earnings if it is from operating earnings as profit.

FINANCIAL ANALYSIS

HOW CAN A PERSON FROM A NON-FINANCE BACKGROUND LEARN FUNDAMENTAL ANALYSIS FOR VALUING COMPANIES?

The value of a company is essentially the estimate of the present value of its future cash flows.

The technique that is at the core of corporate finance is calculating the present value of future cash flows. That is a mouthful, but the basic gist is based on the time value of money and the idea that a company is essentially an entity that generates cash flows each year into the future. The trick is estimating those future cash flows and how much they might grow or shrink and what the risks are to realizing them.

This is where you have to polish your crystal ball and do some deep analysis of the business and its markets and competitors. All this information is compiled in a spreadsheet of financial projections and the bottom line future cash flows are discounted back to the present value at some determined discount rate. The discount rate takes into account what similar investments are commanding in the market and any and all risks specific to this particular enterprise or asset.

This technique of calculating the present value of a stream of cash flows becomes essential when trying to value start-ups that have no revenue history or assets, or companies that are predicted to grow rapidly. In these cases you can't rely on past performance and history in order to come up with a value based on P/E or existing assets.

This is the technique favored by investment bankers, venture capitalists, private equity, hedge funds, and savvy investors, banks and credit analysts, and CFOs. It's not difficult to understand and you will be amazed how useful and powerful it can be.

FINANCIAL STATEMENT ANALYSIS: WHAT CHARACTERISTICS DOES A HEALTHY BALANCE SHEET HAVE?

A good balance sheet conveys the information in a clear and transparent manner.

The Balance Sheet is a condensed statement that shows the financial position of an entity on a specified date, usually the last day of an accounting period.

Among other items of information, a balance sheet states

- What Assets the entity owns,
- How it paid for them,
- What it owes (its Liabilities), and
- What is the amount left after satisfying the liabilities (its Equity)

Balance sheet data is based on what is known as the Accounting Equation: Assets = Liabilities + Owners' Equity.

Think of a Balance Sheet in terms related to everyday life. Home ownership, when you have a mortgage, is represented as a Balance sheet. Your home ownership basically has the three components of Asset, Liability and Equity. The Asset is the value of the house. This is determined by an appraisal. An appraisal takes into account recent sales of homes in the area and compensates for differences like the number of bath or bedrooms, the size of the lot, etc.

The Liability is the mortgage. This is how much you owe against the house. The Equity is the difference between the value of the Asset and the amount of the Liability. If your home is worth $200,000 and you have a remaining mortgage balance of $150,000, then you have $50,000 in Equity. We sometimes call this homeowner's equity.

If your mortgage balance is more than the value of the home, then you are considered "upside down" or "under water". The same principle applies to a business: if the value of its Liabilities is more than the value of the Assets then the enterprise is insolvent and probably headed for bankruptcy.

A Balance Sheet is organized under subheadings such as current assets, fixed assets, current liabilities, Long-term Liabilities, and Equity With income statement and cash flow statement, it comprises the financial statements; a set of documents indispensable in running a business.

HOW DO I FIND WHETHER A COMPANY IS FUNDAMENTALLY GOOD OR NOT?

The Graham and Dodd approach is referred to as Fundamental Analysis and includes: Economic analysis; Industry analysis; and Company analysis. Company Analysis is the primary realm of financial statement analysis. On the basis of these three analyses the value of the security is determined. Fundamental analysis is how bankers, analysts, and investors make long-term investment decisions.

WHAT ARE THE "BALANCE SHEET RATIOS" USED IN FINANCIAL STATEMENT ANALYSIS?

Financial ratios are powerful tools used to assess company upside, downside, and risk.

There are four main categories of financial ratios: liquidity ratios, profitability ratios, activity ratios, and leverage ratios. These are typically analyzed over time and across competitors in an industry.

Using ratios "normalizes" the numbers so you can compare companies in apples-to-apples terms.

Ratios compare numbers reported on the Balance Sheet and the Income Statement.

LIQUIDITY AND SOLVENCY

Solvency and liquidity are both refer to a company's financial health and viability. Solvency refers to an enterprise's capacity to meet its long-term financial commitments. Liquidity refers to an enterprise's ability to pay short-term obligations. Liquidity is also a measure of how quickly assets can be converted to cash by being sold.

A solvent company is one that owns more than it owes. It has a positive net worth and is carrying a manageable debt load. A company with adequate liquidity may have enough cash available to pay its bills, but may still be heading for financial disaster down the road. In this case, a company meets liquidity standards but is not solvent.

Healthy companies are both solvent and possess adequate liquidity.

Liquidity ratios determine whether a company has enough current asset capacity to pay its bills and meet its obligations in the foreseeable future (current liabilities).

Solvency ratios are a measure of how quickly a company can turn its assets into cash if it experiences financial difficulties or bankruptcy.

Liquidity and Solvency ratios measure different aspects of whether or not a company can pay its bills and remain in business.

The current ratio and the quick ratio are two common liquidity ratios. The **current ratio** is current assets/current liabilities and measures how much liquidity (cash) is available to address current liabilities (bills and other obligations). The **quick ratio** is (current assets – inventories) / current liabilities.

The quick ratio measures a company's ability to meet its short-term obligations based on its most liquid assets and therefore excludes inventories from its current assets. It is also known as the "acid-test ratio."

The **solvency ratio** examines the ability of a business to meet its long-term obligations. Lenders and bankers commonly review solvency. The ratio compares cash flows to liabilities. The solvency ratio calculation involves the following steps:

All non-cash expenses are added back to after-tax net income. This approximates the amount of cash flow generated by the business. You can find the numbers to add back in the Operations section of the Cash Flow Statement.

Add together all short-term and long-term obligations. This summation is the Total Liabilities number on the Balance Sheet. Then divide the estimated cash flow figure by the liabilities total.

The formula for the ratio is:

(Net after-tax income + Non-cash expenses)/(Short-term liabilities + Long-term liabilities)

A higher percentage indicates an increased ability to support the liabilities of the enterprise over the long-term.

Remember that estimations made over the long term are inherently inaccurate. Many variables can impact the ability to pay in the long run. Using any ratio used to estimate solvency is subject to a degree of uncertainty.

PROFITABILITY RATIOS

Profitability ratios are ratios that help discern how profitable a company is. To be profitable, a company has to cover costs. The breakeven point and the gross profit ratio address the dynamics of cost coverage in different ways.

The breakeven point calculates how much cash a company must generate to break even with their operating costs.

The gross profit ratio is equal to (revenue - the cost of goods sold)/revenue. This ratio provides a quick snapshot of expected revenue that can cover the overhead expenses and fixed costs of operations.

Some additional examples of profitability ratios are profit margin, return on assets, and return on Equity. The higher the value in these ratios, the more profitable a company is. Having a higher value relative to a competitor's ratio, or the same ratio from a previous period, is indicative that the company is performing relatively well and going in the right direction.

Return on Equity

Return on Equity (ROE) = Net Income / Average Shareholders' Equity

Earnings per Share

Earnings per share (EPS) is the portion of the company's profit, which is allocated to each outstanding share of common stock.

Earnings per share is an excellent indicator of the profitability of any organization, and it is one of the most widely used measures of profitability.

Activity ratios

Activity ratios show how well management is doing managing the company's resources. Activity ratios measure company sales relative to another asset account.

The most common asset accounts used are accounts receivable, inventory, and total assets. Since most companies have a lot of resources tied up in accounts receivable, inventory, and working capital, these accounts are in the denominator of the most common activity ratios.

Accounts receivable (AR) is the total amount of money due to a company for products or services sold on a credit account. The length of time until AR is collected is critical. A company must finance that expected revenue in some way. You can't pay bills with AR.

The accounts receivable turnover shows how rapidly a company collects what is owed to it and indicates the liquidity of the receivables.

Accounts Receivable Turnover = Total Credit Sales / Average Accounts Receivable

The average collection period in days is equal to 365 days, divided by the Accounts Receivable Turnover.

Another ratio that helps gain insight into AR collection is:

Average Collection Period = 365 Days / Accounts Receivable Turnover

Analysts frequently use the average collection period to measure the effectiveness of a company's ability to collect payments from its credit customers. The average collection period should be less than the credit terms that the company extends to its customers.

A significant indicator of profitability is the ability to manage inventory. Inventory is money and resources invested that do not earn a return until the product is sold.

The longer inventory sits, the less profitable a company can be. A higher inventory turnover ratio indicates more demand for products, better cash management, and also a reduced risk of inventory obsolescence.

The best measure of inventory utilization is the **inventory turnover ratio**. You calculate it as either the total annual sales or the cost of goods sold (COGS), divided by the cost of inventory.

Inventory Turnover = Total Annual Sales or Cost of Goods Sold / Average Inventory

Using the cost of goods sold in the numerator can provide a more accurate indicator of inventory turnover because it allows a more direct comparison with other companies. Different companies have different markups to the sale price, and this can obscure apples-to-apples comparison.

The average inventory cost is usually used in the denominator to compensate for seasonal differences.

LEVERAGE RATIOS

Leverage ratios analyze the degree to which a company uses debt to finance its operations and assets. The debt-to-equity ratio is the most common. You calculate this ratio as:

(Long-term debt + Short-term debt + Leases)/ Equity

Companies with high debt ratios need to have steady and predictable revenue streams to service that debt. Companies whose revenues fluctuate and are less predictable should rely more on Equity in its capital structure. Leverage also has obvious implications for solvency.

Startups rely almost entirely on Equity as they have no revenues or very uncertain revenues that can service debt.

DUPONT ANALYSIS

The DuPont Corporation developed DuPont analysis in the 1920s as a tool to assess their investments across their various companies and operations. As a conglomerate, they need a tool to evaluate the relative performance of their different business units.

Dupont analysis is a tool to make decisions about where and how to allocate resources. It has become a widely adopted managerial and investment tool.

What drives ROE?

DuPont Analysis analyzes Return on Equity by deconstructing it into its main drivers.

DuPont Analysis is an expression, which breaks return on Equity (ROE) into three parts.

The basic formula is:

ROE = (Profit margin)*(Asset turnover)*(Equity multiplier) =

(Net Income/Sales)*(Sales/Assets)*(Assets/Equity) = (Net Income/Equity)

The three constituent parts are:

- Profitability: measured by profit margin

- Operating efficiency: measured by asset turnover
- Financial leverage: measured by equity multiplier

DuPont analysis enables you to understand the source of superior (or inferior) return by comparison with companies in similar industries or between industries. It also provides a deeper level of understanding by parsing apart the significant variables and drivers of Return on Equity. And ROE is undoubtedly a metric that equity investors (stock investors) find essential.

Summary

Financial ratios are powerful tools. Use them to assess company upside, downside, and risk when you are evaluating stock investments.

There are four main categories of financial ratios:

·Liquidity ratios,

·Profitability ratios,

·Activity ratios,

·Leverage ratios.

These are typically analyzed over time and across competitors in an industry.

Ratios "normalize" the numbers so you can compare companies in apples-to-apples terms.

IS IT POSSIBLE TO CALCULATE ROUGHLY HOW MUCH HAS BEEN INVESTED IN A COMPANY IN TERMS OF THE SUM OF ALL PRICES PAID FOR ITS CURRENTLY OWNED STOCK? MARKET CAP ISN'T THE ANSWER, THAT IS THE CURRENT PRICE * NUMBER OF SHARES, NOT THE AMOUNT INVESTED.

Look at the Equity section of the Balance Sheet. There are three parts to the equity section:

- Par Value
- Additional Paid In Capital (APIC)
- Retained Earnings

You want to look at Par and APIC together. Par is a way to keep track of all the shares issued. Par is an arbitrary number like one dollar or one cent. APIC is all the additional money that was invested in the company when shares were issued.

Retained Earnings is the cumulative amount that has been contributed to Equity by operations over the years. Each year the addition, or subtraction, to RE is the Net Income (or loss) less any dividends.

WHAT ARE A FEW REASONS THAT YOU WOULD INVEST IN A COMPANY WITH A HIGH PRICE TO EARNINGS RATIO?

Companies command high PEs when investors bid up the stock price because they believe the company has significant growth prospects for the future.

The value of a stock is basically the accumulated guesses of all the investors as to the present value of the stream of future earnings.

All the investors are doing this calculation, either in their head as a rough estimate, or with fancy spreadsheet models with lots of refined assumptions.

As a rough rule: high growth companies have high PE ratios and low growth companies have low PE ratios.

HOW DOES ONE VALUE A COMPANY? WHERE CAN I LEARN MORE ABOUT WHAT DETERMINES THAT VALUE? IS THERE A WAY TO DO BACK OF A NAPKIN CALCULATION (LOOK AT PUBLICLY KNOWN METRICS) AND ARRIVE AT A BALLPARK VALUE THAT IS DEPENDABLE?

Valuation is an estimate of something's worth. Something's worth can be set at auction where people bid and the highest bidder wins. But how do bidders know how much to bid and how much is too much?

The stock market is essentially an auction where investors place bids: how much they are willing to pay for a stock and asks: how much an investor is willing to sell for.

The book Barbarians at the Gates tells the story of the conglomerate RJR Nabisco and its sale to the highest bidder. The buyout firm KKR

ultimately won with the highest bid and bought the company. All the bidding groups went through lots of machinations to uncover the value of all the assets and divisions of RJR Nabisco.

Valuation of companies and assets can seem mysterious; where do you even begin? How can you value a startup that doesn't even have any revenues yet?

There are essentially two basic techniques that are used in Valuation. One is ratio analysis of financial statements and the other is calculating the present value of future cash flows. Bankers, investors, financiers and entrepreneurs use these tools and techniques.

By ratio analysis we mean taking two numbers from financial statements and dividing one by the other. This technique is good for comparing different companies or the same company over time. This works well because it eliminates any relative size differences between the companies so you can compare apples to apples.

A particularly common valuation of companies done by ratio analysis is based on multiples of Earnings. The price/earnings ratio P/E is a way companies are compared based on their stock price relative to their earnings (also called net income or profit) in the most recently reported year. The earnings number is the bottom line of the Income Statement. This works well for comparing public companies that report these numbers. This technique can be used to value a private company by comparing its earnings and valuation range to an average of public reporting companies in similar industry sectors and markets. This ratio technique can be used based on a multiple of revenues, the top line of the Income Statement.

You can also value the Assets of a company from its Balance Sheet. Here you have to make adjustments for assets that have been depreciated and are reported as less valuable on the balance sheet, their book value, than their market value is. A company can be thought of as a bunch of income producing assets.

The second technique that is at the core of corporate finance is calculating the present value of future cash flows. That is a mouthful, and I will break down the methodology in some subsequent posts, but the basic gist is based on the time value of money and the idea that a company is essentially an entity that generates cash flows each year

into the future. The trick is estimating those future cash flows and how much they might grow or shrink and what the risks are to realizing them.

This is where you have to polish your crystal ball and do some deep analysis of the business and its markets and competitors. All this information is compiled in a spreadsheet of financial projections and the bottom-line future cash flows are discounted back to the present value at some determined discount rate that takes what similar investments are commanding in the market and any and all risks specific to this particular enterprise or asset.

This technique of calculating the present value of a stream of cash flows becomes essential when trying to value start-ups that have no revenue history or assets, or companies that are predicted to grow rapidly. In these cases, you can't rely on past performance and history in order to come up with a value based on P/E or existing assets.

This is the technique favored by investment bankers, venture capitalists, private equity, hedge funds, and savvy investors, banks and credit analysts, and CFOs. I will go into detail on this powerful tool in subsequent blog posts. It's not difficult to understand and you will be amazed how useful and powerful it can be.

HOW DO YOU ASSESS WHETHER A COMPANY'S DEBT LOAD IS TOO RISKY?

Basic credit analysis is a place to start. Analyze how robust and steady the revenues are. Are there lots of customers? Are there long-term contracts in place? Do they have a long operating history? Then analyze net income. Is it stable and growing?

Then look at the debt obligations. Are there big payments coming due? Is there a crisis at maturity for paying back debt? What is the debt service coverage ratio DSCR? That is how much of net income is needed to service debt each month.

Has the debt been used to purchase long term productive income producing assets?

Less debt is better.

CORPORATE FINANCE

DO WE CONSIDER CAPITAL BUDGETING AS AN ACCOUNTING CONCEPT OR A FINANCIAL ONE, OR IS IT IN BETWEEN?

The capital budgeting process is a hybrid of accounting and finance. It is forward looking so it uses corporate finance techniques. And budgets are constructed using pro forma financial statements so it is part accounting.

Budgets are financial projections developed for a relatively short and predetermined period of time. Most budgets are prepared for the next year and divided into detailed monthly budgets. Budgets can be expected to be reasonably accurate because they represent estimates of relatively short time periods and because they rely on historical information about the company.

Budgets are created, reviewed, and approved and then used to measure the actual performance of the company each month. Did the company under or over perform relative to the budget? The differences between the actual accounting prepared at the end of the month and the budget amounts is called a Variance.

Variances are reviewed and discussed to see why some line items went over budget and why some may be significantly under budget. Budgets are developed using historical performance data, which means that they are relatively predictive of the levels at which a company should be operating. And the budget will reflect the goals that management hopes to achieve in the coming year.

Budgeting is part of the planning process and reviewing the actual results against the budget on a regular basis is good management practice.

WHEN A COMPANY'S AWARD SPECIAL DIVIDEND PAYMENTS, IS THAT EQUITY EXTRACTED FROM MARKET CAPITALIZATION?

Market capitalization is the value that investors place on a company through trading in its stock.

If a share of stock is trading at $10 per share and there are 100

million shares outstanding, then the company's market cap is $1 Billion.

Dividends are paid out of earnings. Earnings, Profit, and Net Income mean the same thing; they are synonymous. Earnings, net of dividends, are plowed into the Retained Earnings section of Equity on the Balance Sheet.

So, the amount that gets put into Retained Earnings at the end of the year is less by the amount paid out to shareholders as a dividend.

The accounting book value of the company and the market cap are independent of each other.

HOW DO YOU ESTIMATE THE AGGREGATE VALUE OF PRIVATE COMPANIES?

If you are selling or acquiring a company, then the value will ultimately be determined by negotiation. To support the ask and offer there will two methods of valuation:

Valuing the assets: how much each asset is worth in the market.

Present Value of future cash flows: an estimate of the future cash flows discounted back to the present. Picking a discount rate and estimating future revenues and costs etc. requires a number of assumptions that can be challenged and must be agreed upon.

If you want more information on discounting cash flows and present value calculations, check out my book on corporate finance.

WHAT'S THE REASON A COMPANY DOESN'T WANT TO GO PUBLIC?

Highly functioning public equity markets are one of the two greatest economic innovations of the twentieth century. The other is the corporate form of organization. Together these two forces have driven economic development and rising standards of living.

There was a time when the public markets were the only vehicle for raising large sums of money for growing enterprises. Now there are alternative sources of significant capital.

There are many companies these days that have surpassed a billion dollars valuation without being publicly traded. Private Equity is a thriving investment segment where public companies are acquired and

taken private. The idea here is to unleash latent value that the public market was underpricing.

These are two examples of industry segments that do not rely on public markets for pricing or funding.

Going public via an IPO is an expensive and time consuming proposition. Once a company is public there are burdens of reporting that require staff and auditors. A lot of information about the company and its operations must be disclosed. That information disclosure can compromise some competitive advantage.

Investors are quick to punish a public company by selling its stock if it doesn't meet quarterly expectations. This can detract from long term strategic planning and put an emphasis on short term expediency in operations.

I took two companies public and was a public company CEO and CFO for almost two decades. I also took one of those companies private again.

Going public is the right choice under certain circumstances. Staying private has advantages under other sets of circumstance. It's about choosing the right tool for the right job.

HOW MANY INDUSTRIES ARE THERE IN THE WORLD? HOW CAN I GET TRUSTFUL SOURCES THAT UPDATES ABOUT THIS?

The standard industry classification SIC system is a good place to look. Every publicly traded company lists their SIC on the front page of their 10K so you can tell in which industry they consider themselves primarily operating.

SIC is a system for classifying industries by a four-digit code. It was established in the U. S. in 1937. It is used by government agencies and corporations to classify industry areas. The SIC system is also used by agencies in other countries such as the U.K.

HOW DOES A COMPANY BENEFIT FROM A LOW STOCK PRICE?

I can't think of any benefits that can accrue to a company from a low stock price. Low and high are relative terms and have to do with

investor's perception of the company's prospects to grow and make profits in the future. The stock price is essentially the cumulative estimate of the present value of the future cash flows of the company. A low stock price means that investors don't think too highly of the company's prospects going forward.

THANK YOU FOR READING!

Dear Reader,

I hope you enjoyed ***Finance ASAP*** and found it filled with useful and valuable information..

As an author, I love feedback. Candidly, you are the reason that I organize my thoughts, write, and explore these topics. So, tell me what you liked, what was helpful and what could be better explained or left out. You can write me at john@mba-asap.com and visit me on the web at www.mba-asap.com.

Finally, I need to ask a favor. I'd love a review on Amazon of ***Finance ASAP***. I'd just appreciate your feedback.

Reviews can be tough to come by these days. You, the reader, have the power now to make or break a book. If you have the time, here's a link to my author page on Amazon where you can find all of my books: https://www.amazon.com/-/e/B01JVF2XTU or just search for the title and my name on Amazon. A quick review will be immensely appreciated!

Thank you so much for reading ***Finance ASAP*** and for spending the time and effort with me.

In deep gratitude,

John Cousins

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ABOUT THE AUTHOR

John Cousins (@jjcousins) is an investor, tech founder, and bestselling author of Understanding Corporate Finance and over 40 other books.

John is the founder of MBA ASAP, which provides training to individuals and corporations including Adidas, Apple, General Mills, Kaiser Permanente, Lyft, PayPal, Pinterest, Mercedes-Benz, and Volkswagen.

John has taught MBA students at universities worldwide.

Currently General Partner at Tetraktys Global, a quantitative hedge fund, he is an early investor in many successful tech companies and crypto protocols, including Databricks, SpaceX, Anthropic, Discord, Udemy, Coursera, Fastly, UiPath, Palantir, Bitcoin, Chainlink, Ethereum, and Solana.

John was the cofounder of Biomoda (IPO 2006), Advanced Optics Electronics (IPO 1999), FoodSentry (epic fail), MBA ASAP, and Tetraktys Global. He holds undergraduate degrees from MIT and Boston University and an MBA in finance from Wharton.