

Finance for Non-Finance Managers

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Module I

- Non-financial manager's concern with finance
- Scope and Role of Finance
- Importance of Finance
- Responsibilities of Financial Managers
- Distinguish between Accounting And Finance
- Characterize and Identify the Financial and Operational Environments
- Compliance vs. Operations

Non-financial Manager's Concerns

- What to look out for and keep in mind!
- Planning, Problem-Solving and Decision Making
- What do businesses look for?
- Know what the numbers mean in compliance and operational context
- How do you Plan with financial toolset?
- Appropriate Data Points and Backups as necessary
- Strategic Proposals: How finance plays a role
- Capital Investment: How finance plays a role

Scope and Role of Finance

- Finance uses accounting information
- Financial accounting vs. Managerial Accounting
- Fund management and performance monitoring
- Look at current problems and manage prospective issues
- Fundamental is the return-risk or reward-risk tradeoff
- Who would benefit?
 - Marketing and Sales
 - Production
 - Internal Operations
 - Human Resources
 - Investment Analysts

What do Financial Managers do?

- Financial Analysis and Planning
- Investment Decisions
- Financing and Capital Structure Decisions
- Manager Financial Resources

Financial Managers attempt to maximize shareholder wealth

- Present and future earnings (EPS)
- Timing and risk of earnings assessment
- Dividend policy
- Manner of financing

Relationship between Accounting and Finance

- Accounting is input and sub-function to Finance
- Financial responsibilities carried out by the Controller, Treasurer, CFO
- The responsibilities are fairly distinctive depending on the size of the organization
- Management works with finance in 2 ways
 - Record-keeping, tracking and controlling financial data
 - Obtain and manage funds to support management objectives
 - Ensure that data is standardized for external reviews and analysis

Key Personnel Responsibilities

- **Controller**
 - Accounting
 - Budgeting
 - Internal Audit
 - Asset Protection
 - **Treasurer**
 - Obtain Financing
 - Investor Relations
 - Financing Mix
 - Cash Management
 - **Chief Financial Officer**
 - Support Short –Term Corporate Objectives
 - Support Long-Term Corporate Objectives
 - External facing to stakeholders – Creditors, Investors, Internal Employees
 - Assessing Risk-Reward tradeoffs
 - Designing Interfaces across multiple departments
 - Partnerships and Business Development Support
 - Tax Strategies , Financing Strategies, Operation Strategies
- | | |
|----------------------|--------------------|
| Financial Reporting | Records |
| Controls | Taxes |
| Payroll | Interpretation |
| Govt. Reporting | Analysis of Data |
| Banking Relationship | Investment of fund |
| Insuring Assets | Relationship mgmt |
| Dividend Policies | Pension Mgmt |
| Credit Appraisal | Matching |

The Financial Environment

- Financial Intermediaries
 - Efficient transfer of funds from savers to individuals, businesses and governments
- Financial Markets are composed of
 - Money Markets
 - Short –Term (less than one year) debt securities.
 - US Treasury Bills, Commercial Paper, Negotiable Certificate of Deposits
 - Capital Markets
 - Long-Term Debt and Stocks
 - NYSE, AMEX and OTC (over-the-counter)
- Financial Assets vs. Real Assets
 - Financial Assets: Intangible Investments
 - Equity Ownership in Company, Debt, Rights and Obligations to Exchange
 - Real Assets: Tangible Investments
 - Real Estate, Machinery and Equipment, Metals, Oil

Business Organizations

- Sole Proprietorship
 - One Owner
 - Income is Personal
 - Life is limited
 - 100% Profits and Control

Organization Cost is Minimal
Unlimited Liability
Lacks fund-raising ability
Full Confidentiality
- Partnership
 - Multiple Owners
 - Informal Arrangement
 - Each partner is an agent
 - Better credit reach

Minimal Organizational Costs
Rights are defined
Dissolves upon Withdrawal or Death
Limited Liability & Unlimited Liability
- Corporation
 - Separate Entity
 - More Organization Needed
 - Transfer of Ownership
 - Double Taxation

Limited Liability
Unlimited Life
Raise Capital easier
Bankruptcy does not discharge tax obligations
- Hybrid Structures
 - Limited Partnership
 - Shell Corporations

S-Corporation
Special Purpose Entities

Module 2

- Importance of Cost Data
- Describe the Types of Costs
- Cost Concepts for planning, control and decision-making
- Cost Behavior
- Segregate fixed and variable costs
- Cost Allocations
- Factors in Cost Analysis

Why Cost Data?

- Costs may drive Selling Price
- Costs must be comprehensive
- Costs are meaningful if all factors considered
- Full Cycle Costing is the Key Parameter
- Costs sets the tone for decision making
- Cost is useful for Planning and Budgetary Cycles
- Costs enable decision making around Capacity

Types of Costs

- Direct Material
- Direct Labor
- Overhead
- Opportunity Cost
- Operating Costs
 - Selling Expenses
 - Research and Development
 - General and Administrative
- Government Costs
- Prime Costs: $DM + DL$
- Conversion Costs: $DL + \text{Overhead}$
- Period Costs: Cost incurred during a period. Charged to revenue immediately within the year
- Product Costs: Costs are charged to products upon sale of the product
- Fixed Costs: Costs remain constant regardless of product activity
- Variable Costs: Costs change with respect to the activity being supported
- Semivariable costs: Mixed Costs like a fixed costs + a variable component

Other Cost Concepts

- Controllable vs. Uncontrollable Costs
- Standard Costs
- Incremental Costs
- Sunk Costs
- Relevant Costs
- Opportunity Costs
- Joint Costs
- Discretionary Costs or Swag Costs

How do Costs Behave

- Some Costs are variable
- Some Costs are fixed
- Time drives the fixed and variable components

<u>Sales of Computers</u> <u>Volumes</u>	<u>Standard Cost of</u> <u>Materials (\$1)</u>	<u>Standard Cost of</u> <u>Direct Labor (1.50)</u>	<u>Factory</u> <u>Rent (\$50,000)</u>	<u>Unit Cost</u>	<u>Total Cost</u>
50,000	\$ 50,000	\$ 75,000	\$ 50,000	3.50	\$ 175,000
75,000	\$ 75,000	\$ 112,500	\$ 50,000	3.17	\$ 237,500
125,000	\$ 125,000	\$ 187,500	\$ 50,000	2.90	\$ 362,500

** Variable Cost is \$2.50
 ** Fixed Cost per Unit goes down over increase in Volume
 *** Capacity Decisions can be made, assuming behavior is the same
 **** Learning Curve Imputation in advanced planning

	<u>75000 Units</u>	<u>25000 Units</u>
Change in Total Cost	\$ 187,500	\$ 62,500
Change in Volume	75,000	25,000
Change for Incr. Production	2.50	2.50

Overhead Allocation

- Overhead Allocation is based on Standards
- Activity Based Overhead Allocations
- Overhead Allocation maybe subject to change
- Overhead Allocation needs to be revisited depending on the company
- Overhead Allocation is crucial for capacity planning
- Refer to previous example
 - Case I: Advertising Costs
 - What to keep in mind: Period vs. Product Costs
 - What is the best allocation procedure
 - What is the objective of the allocation procedure
 - Is it a science or an art?
 - **Warning: This is a Dangerous Cost that is the MOST CONTENTIOUS IN COMPANIES**

Module 3: Contribution Analysis

- What is Contribution Analysis?
- Why do it?
 - Pricing Strategy
 - Product Decisions
 - Product Mix Decisions
 - Performance Assessment
 - Non-Recurrent Costs Factoring

Target Analysis

Widget Costs Per Unit							
Units	Selling Price	Total Sales	Variable Costs	Total Variable Costs	Contribution Margin	Fixed Costs	Profit
1 \$	25 \$	25 \$	10 \$	10 \$	15 \$	5,000 \$	(4,985)
10 \$	25 \$	250 \$	10 \$	100 \$	150 \$	5,000 \$	(4,850)
200 \$	25 \$	5,000 \$	10 \$	2,000 \$	3,000 \$	5,000 \$	(2,000)
300 \$	25 \$	7,500 \$	10 \$	3,000 \$	4,500 \$	5,000 \$	(500)
333.33 \$	25 \$	8,333 \$	10 \$	3,333 \$	5,000 \$	5,000 \$	(0)
500 \$	25 \$	12,500 \$	10 \$	5,000 \$	7,500 \$	5,000 \$	2,500

Contribution Margin = Selling Price - Variable Costs
 Contribution Margin in \$\$\$ = \$15
 Contribution Margin Ratio = 60% (\$15 CM \$/ \$25 Selling Price)

Breakeven Sales in \$\$\$ = Fixed Costs/ Contribution Margin Ratio
 Breakeven Sales in \$\$\$ = + 8333.333333 (\$5000/60% Contribution Margin Ratio)
 Breakeven Sales in Units = 333.333333 (BE Sales in \$\$/ Selling Price per Unit)

Target Profit = (Breakeven Sales in \$\$\$ + Target Profit) / Contribution Margin Ratio
 Target Profit = \$2,500
 Target Coverage \$7,500 (Fixed Costs + Target Profit)
 Target Sales in \$\$\$ \$ 12,500 (Target Coverage/ Contribution Margin Ratio)
 Target Sales in Units 500

You have Idle Capacity!

- Idle Capacity
 - Presence of unused capacity together with insufficient raw materials or skilled labor. When idle capacity exists, a firm can take on an incremental order without increasing the fixed costs.
- Take the previous example:
 - 50% Idle Capacity: Can produce up to 1000 units with no increase in fixed costs
 - An order comes in and buyer wants to pay \$5, \$10, \$15
 - What would you take and why?
- Important to note the following:
 - These are strategic decisions
 - Channel Conflicts may emerge
 - Type of industry organization and information dissemination
 - Long-Term view is important
- Contribution Margin Analysis is good for Market Penetration Decisions
 - Absorb the fixed cost by producing to full capacity
 - Lower the Pricing to meet a total profit objective
 - The experience curve or learning curve impact kicks in!
- Full Capacity Utilization (100%)
 - Produce up to the quantity that will not change Fixed Costs --- 1000 units
 - Fixed Cost per Unit = \$5.00
 - Variable Cost per Unit = \$ 10.00
 - Pricing can be \$15.00 to BE or \$18.00 for 20% Margins.
 - Difference in Pricing is \$7.00 (\$25 vs. \$18).
 - Get greater market share
 - High Market Share will increase the experience and learning curve thus impacting and lowering Variable Costs

Experience Curve Impact!

Widget Costs Per Unit at 80% Learning Curve										
<u>Units</u>	<u>Selling Price</u>	<u>Total Sales</u>	<u>Variable Costs (no learning curve)</u>	<u>Variable Costs (learning curve)</u>						
10	\$	25	\$	250	\$	10	\$	10		
20	\$	25	\$	500	\$	10	\$	8		
40	\$	25	\$	1,000	\$	10	\$	6		
80	\$	25	\$	2,000	\$	10	\$	5		
160	\$	25	\$	4,000	\$	10	\$	4		

Management will know at what stepped up volumes will experience curve kick in
For various scales, experience curve could be different

***** As cumulative output doubles, the experience curve kicks in!***

Experience Curve simply put means that as you build more and more widgets, you build them faster so that the average time spent per widget becomes lower, and thus average variable costs become lower. Thus an 80% experience curve means that you are becoming efficient by 20% as you double your production.

Module 4: Relevant Costs

- Are not all costs relevant?
- Why are relevant costs *relevant*?
- Make or Buy Decisions
- Optimize Resources
- And there are the sunk costs!
- The Cost Paradox

What are Relevant Costs?

- Costs that are relevant for you to make a decision!
- They are the future costs between alternatives
- Sunk Costs are not relevant. You cannot go back and change it
- Sunk Costs relevant for examining the efficiency and effectiveness of past decision-making, hence relevant in that context
- Incremental or Differential Costs are key relevant costs
- Prospective Opportunity Costs are relevant costs
- Thus the key funnel analysis is
 - Take all Costs less the Sunk Costs less Costs that do not differ to examine alternatives and then select the best decision based on the incremental costs measured against the opportunity cost

Example of Relevant Costs

	Sales	Variable Cost	Insurance	Setup Cost	Other Fixed Cost	Profits
Equipment A	\$ 50,000	\$ 30,000	\$ 5,000	\$ 3,000	\$ 7,000	\$ 5,000
Equipment B	\$ 75,000	\$ 45,000	\$ 8,500	\$ 9,500	\$ 7,000	\$ 5,000

Questions to Ask to determine what to buy:

1. If we are to close business today, what decision would you make?
2. Would it be different if we run the business for 4 years?
3. What other considerations would you throw in?
4. How would your analysis change if sales \$\$ changes for Equipment A and/or B?

Joint Costs and Incremental Analysis

- Joint Costs are costs incurred until split-off point
- These are costs that are pretty much unavoidable to get to at least ONE commercially viable product
- Once one product is produced, one can make additional investments to monetize residual value(s)
- In order to assess the economic value, costs and revenues have to be analyzed at the increment
- The initial joint costs for the purposes of additional products in not relevant or sunk
- Production based until at least a break-even is reached

	<u>Joint Cost</u>	<u>Revenue</u>	<u>Incremental Cost</u>	<u>Profits</u>
Non-Refined Oil	\$ 150,000	\$ 250,000		\$ 100,000
Refined Oil		\$ 150,000	\$ 75,000	\$ 75,000
Petroleum		\$ 100,000	\$ 90,000	\$ 10,000
Other Uses		\$ 20,000	\$ 25,000	\$ (5,000)

Product Abandonment Decisions

- Companies want to reduce their product lines to focus on profitable products
- Assume that there is no change in fixed costs in the short-run
- Decision to drop the product will be based on ranking the contribution margin
- Products with the highest contribution margin should be kept in play

	<u>Product A</u>	<u>Product B</u>	<u>Product C</u>	<u>Total</u>
Sales	\$ 35,000	\$ 50,000	\$ 45,000	\$ 130,000
Less: Variable Costs	\$ 25,000	\$ 40,000	\$ 35,000	\$ 100,000
Contribution Margin (CM)	\$ 10,000	\$ 10,000	\$ 10,000	\$ 30,000
CM Ratio	29%	20%	22%	23%
<u>Less:</u>				
Fixed Costs Allocated	\$ 8,000	\$ 8,000	\$ 8,000	\$ 24,000
Allocation based on Product Lines	33%	33%	33%	100%
Total Profit after Allocation	\$ 2,000	\$ 2,000	\$ 2,000	\$ 6,000

Fixed Costs do not change!

It is all about the Margins!

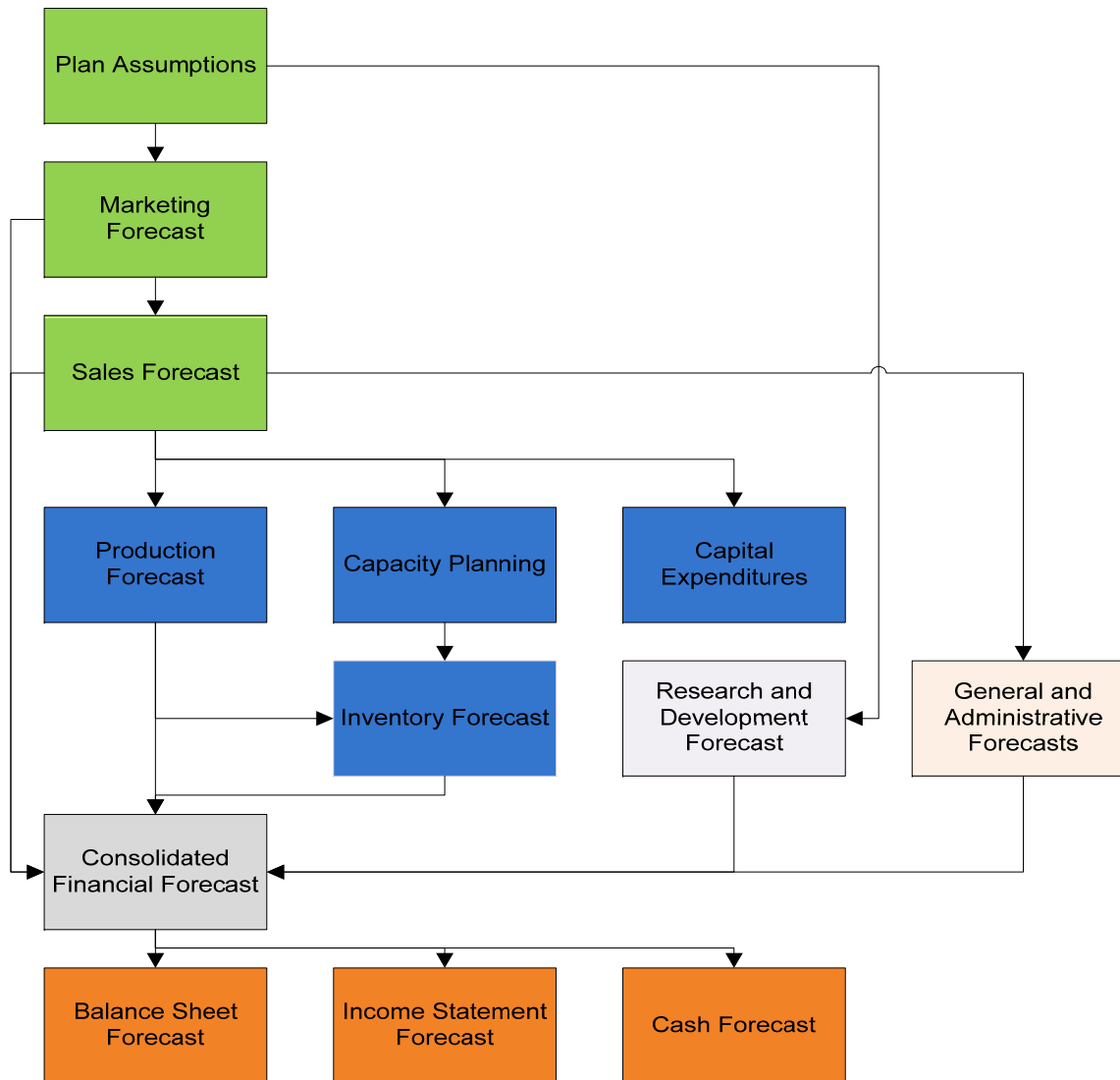
Keep in mind experience curve for forecasting purposes!

Keep in mind idle capacity or full utilization for product abandonment decisions

Module 5: The Budget

- The Budgeting Process or The Operating Plan
- The Budgeting Workflow
- The Cash Budget
- Forecast and the Internal Reviews
- Forecast and the External Commitments
- Revisiting Forecasts or Re-forecasts
- Plan and the Forecasting Cycle

The Planning Cycle



The Plan Cycle

- You have ONE OPERATING PLAN or THE PLAN for a fiscal period (could cover one or more fiscal periods)
- The operating plan sets the tone
- This is the plan that is established internally
- There could be two plans – a management plan and plan for everyone else
- Plans are linked to corporate objectives
- Objectives are established internally by management based upon discussions and feedback internally and externally
- The Plan is built upon a set of assumptions and objectives

Corporate Objectives

- Sales Objectives
 - To get 10% of the target market in 1 year.
 - To become the #1 or #2 in the category
- Production Objectives
 - To reduce the costs of existing products by 30%
 - To retool existing capacity for greater productivity
 - To develop a strategic platform to create new high quality products faster
 - To reduce inventory
- Research and Development
 - To differentiate products by embedding new technologies and processes that can be patented
 - To have quicker and effective commercial release of new technologies
- Financial Objective
 - To maximize cash flow by managing vendor float
 - To buyback shares to increase share price
 - To increase dividend for long-term enhanced value
 - To reduce cash tied in inventory and fixed costs
 - To raise financing at the maximum valuation based on EBIT (Earnings before Income Taxes)
 - To ensure that company meets the covenant rulings

Process

- Assumptions are clarified and agreed upon
- What-if scenarios are played out at the highest level
- Contingencies are articulated
- Top-Down Operating Plan Parameters are established
- Objectives are defined – preferably with metrics
- Objectives are passed down to Business Unit or Functional Heads
- Numbers are crafted bottoms up
- Reserves established bottoms up for contingencies.(Sandbagging)
- Negotiations, Buy-ins, renegotiations occur. Process may take a month up to several months.
- Top-down parameters and bottom-up numbers are stress tested.
- Formalization and rollout occurs
- There could be multiple budgets : Executive and Operational

Objective 1:	To increase market share to 15%			
Assumption	Target Market is 1M Units			
Assumption	Increase Market Spend to 8% of Sales			
Cost of DL Time per Unit	2 Hours	\$		50.00
Materials Per Unit		Qty	Costs	Total Costs per Unit
Widget A		8	2.5	20
Widget B		15	1.35	20.25
Widget C		10	4	40
Objective				
Objective 2:	To develop new technologies			
Assumption	New engineers and capex for new technologies			
Percentage of Sales Commitment	5%			
G&A Assumption	2%			
		<u><i>Xternal</i></u>		<u><i>Internal</i></u>
		Top Down Plan		Variable
Target Market		1,000,000		1,000,000
Unit Sales Anticipated		150,000		100,000
Average Price Per Sale	\$	250.00	\$	250.00
Direct Labor per Sale	\$	50.00	\$	50.00
Direct Materials per Sale	\$	80.25	\$	80.25
Gross Margin	\$	119.75	\$	119.75
Total Sales in \$\$	\$	37,500,000	\$	25,000,000.00
Total Cost of Sales	\$	19,537,500.00	\$	13,025,000.00
Gross Margin	\$	17,962,500.00	\$	11,975,000.00
Gross Margin %		48%		48%
Marketing and Advertising	\$	3,000,000.00	\$	2,000,000.00
Research and Development	\$	1,875,000.00	\$	1,250,000.00
General and Administrative	\$	750,000.00	\$	500,000.00
Operating Profit	\$	12,337,500.00	\$	8,225,000.00
Taxes at 34% average	\$	4,194,750.00	\$	2,796,500.00
Net Income	\$	8,142,750.00	\$	5,428,500.00

Module 6: Cost Control and Variances

- What is a standard?
- Why variance analysis?
- Flexible Budgets
- List the various cost variances
- The Theory of Constraints
- Activity Based Costing
- Pros and Cons of Standard vs. Activity Based Costing

Define a Standard

- Standard costing is applying a predetermined cost to a product for future periods
- Standard costs generally include
 - Direct Material Costs
 - Direct Labor Costs
 - Allocated Overhead Costs
 - Prime Costs and Conversion Costs
- Costs applied to the product only. These are not operating expenses
- Operating expenses are normalized against Sales and expressed as percentage of Sales

Standard Costs

- Standard costs are the expected costs of manufacturing the product
- Standard Direct Labor Costs = Expected Wage rate X Expected Number of Hours
- Standard Direct Material Costs = Expected Cost of raw materials X Expected number of Units of raw materials
- Standard Overhead Costs = Expected Fixed OH + Expected Variable Overhead X Expected Number of Units to be produced

Standard Cost System

- Method of setting cost targets and evaluating performance
- Costs set based on various criteria, and performance vs. expectations measured
- Material differences between performance vs. expectations investigated
- Helps management in decision making and control

Why have the Standard Cost System?

- Decision Making
 - How we produce our product
 - How we price our product
 - Contract Billing
- Monitor Manufacturing
 - Large variances may be indicative of problems in production
- Performance Measurement
 - Deviations are used to monitor performance
 - Standard Setting processes based on historical, value pricing, benchmarks
 - Also based on underlying assumptions of optimum, normal operating conditions, capacity, stretch goals

Variances

- Raw Material Price Variance
- Raw Material Quantity Variance
- Direct Labor Wage Variance
- Direct Labor Quantity Variance
- Overhead Variances

COST EFFICIENCY VARIANCES

<u>Standard Costs</u>			
	<u>Standard Qty</u>	<u>Standard Price</u>	<u>Total</u>
<u>Raw Materials</u> <i>(in pounds)</i>			
Wheat	100	\$ 50	\$ 5,000
Hops	200	\$ 50	\$ 10,000
Barley	200	\$ 50	\$ 10,000
<u>Direct Labor</u>			
	500	\$ 20	\$ 10,000
	TOTAL COSTS		\$ 35,000
<u>Actual Results</u>			
	<u>Actual Qty</u>	<u>Actual Price</u>	<u>Total</u>
<u>Raw Materials</u> <i>(in pounds)</i>			
Wheat	100	\$ 55	\$ 5,500
Hops	150	\$ 50	\$ 7,500
Barley	250	\$ 40	\$ 10,000
<u>Direct Labor</u>			
	550	\$ 22	\$ 12,100
	TOTAL COSTS		\$ 35,100

<u>Raw Materials Price</u>					
<u>Variance</u>	<u>Actual Price</u>	<u>Std. Price</u>	<u>Variance</u>	<u>Qty Purchased</u>	<u>Total Variance</u>
Wheat	\$ 55	\$ 50	\$ 5	100	\$ 500
Hops	\$ 50	\$ 50	\$ -	150	\$ -
Barley	\$ 40	\$ 50	\$ (10)	250	\$ (2,500)
					\$ (2,000)
<u>Raw Materials Qty</u>					
<u>Variance</u>	<u>Qty Used</u>	<u>Qty</u>	<u>Variance</u>	<u>Standard Price</u>	<u>Total Variance</u>
Wheat	100	100	0	\$ 50	\$ -
Hops	150	200	-50	\$ 50	\$ (2,500)
Barley	250	200	50	\$ 50	\$ 2,500
					\$ -
<u>Labor</u>					
	<u>Actual Price</u>	<u>Price</u>	<u>Variance</u>	<u>Actual Hours</u>	<u>Total Variance</u>
Labor Wage Variance	\$ 22	\$ 20	\$ 2	550	\$ 1,100
<u>Labor Efficiency</u>					
	<u>Actual Hrs</u>	<u>Std Hrs</u>	<u>Variance</u>	<u>Std Rate</u>	<u>Total Variance</u>
Labor Qty (Efficiency Variance)	550	500	\$ 50	\$ 20	\$ 1,000
TOTAL					\$ 100

Overhead Efficiency Variance

- Measure of the effect of the difference in the amount of an activity base incurred compared to the expected amount of the activity base.
- Overhead is allocated based upon pre-determined standard
- If additional labor or direct materials are used compared to the standard, then that variable overhead rate is applied against the variance in the activity base
- Overhead volume variance measures the costs or benefits of using less or more than expected capacity
 - $\text{Volume Variance} = \text{Fixed Overhead} * (\text{Budgeted Vol} - \text{Actual Volume}) / \text{Budgeted Volume}$
 - If budgeted volume = Actual Volume, no biggie; nothing changes.
 - When budgeted volume < expected volume, fixed costs associated with providing capacity is greater than expectations

Final Word on Standard Costs

- It is widely used and easy to understand
- New age and new methods; Standard costing may not be appropriate anymore
- Overhead allocations can be peanut butter approach. Creates contention
- Alternative methods of costing
 - Activity Based Costing
 - Theory of Constraints

Activity Based Costing

- Costs are accumulated in activity centers
- Examples of Activity or cost centers are Order Processing, Customer Inquiries etc
- Managers select an activity base
- They identify cost drivers
 - Unit Level Drivers
 - Batch Level Drivers
 - Product Level Drivers
 - Product Sustaining Costs
- Costs are thereafter allocated to the product as the product passes through the activity center

Pros and Cons of ABC

Pros

- Costs are directly traceable to products
- How individual products consume costs
- Different activities produce different costs
- Different activities workflow becomes important
- Indirect costs related to the activities
- Product costs are more accurate
- Better and more accurate decision making

Cons

- Finer Understanding of workflow creates complicates
- How many cost drivers to include
- Changes in technology or work process can render the method obsolete
- Small scale costing may not justify this methodology

Theory of Constraints

- Introduced by Eliyahu Goldratt – The Goal
- Originally to maximize cash flow for a manufacturing company
- Application is more wide spread
- Underlying thinking applies across a wide swathe of management issues

Assumptions and Observations

- Company's goal is to maximize cash profit
- Maintain continuity
- Company works as a system
- A system consists of one or more processes
- A process is subject to at least one constraint
- The constraint determines the throughput of the system
- Continual optimization of processes are required to optimize the system
- Optimize the whole system; Not a process

How to manage the constraints

- Identify the constraint in the system
- Decide how to exploit the constraint
- Subordinate all processes to the constraint
- Elevate the constraint
- Start over until the market becomes the final constraint

Constraint Types

- Physical Constraints – Machine and Staff Capacity
- Policy Constraints
- External Constraints

The Radical Ideas in ToC

- Inventory is a liability
- Cash is king and we must act accordingly
- Increased throughput is increased cash
- Minimize work-in-process
- Idle Capacity is good
- Having some work-in-process is good
- Don't focus on productivity – it is the bottleneck metric
- Optimize until constraint is external – that is the dream!
- Standard and Activity Costing are not flow concepts
- Costing methodologies are exactly that – Costing methodologies!
- ToC is active cost management

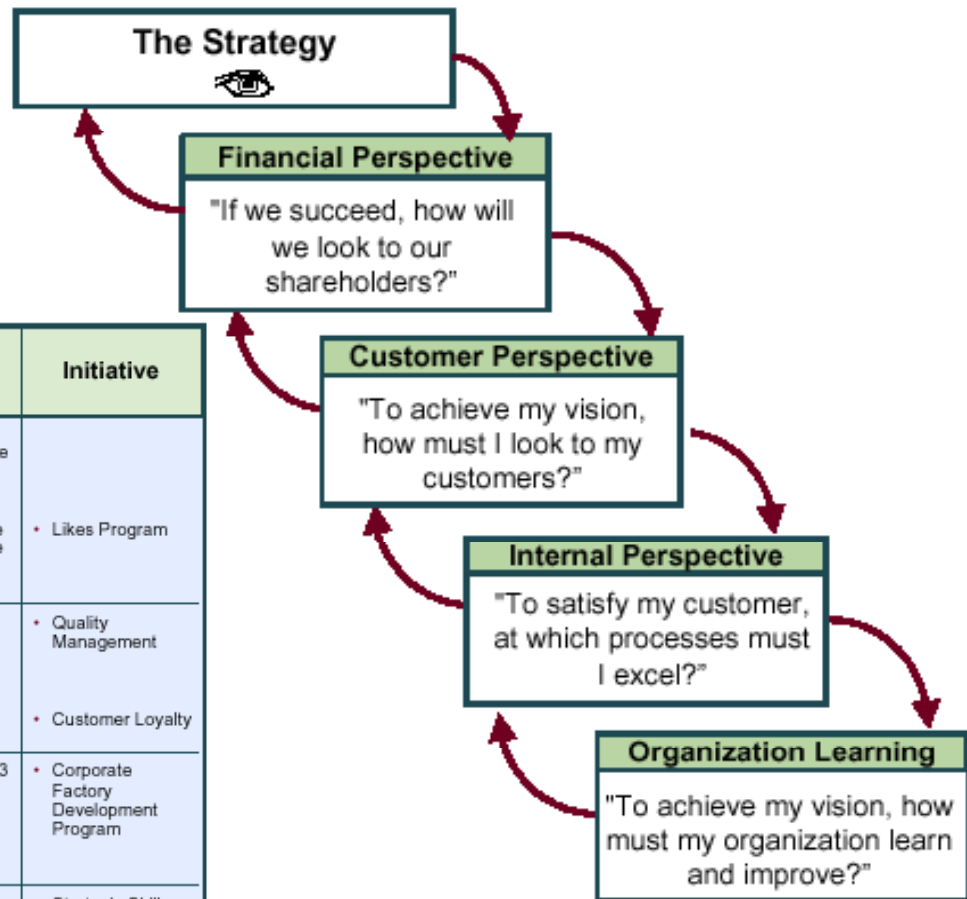
The Gap starts ...

- Strategies guide budgets
- Strategy is the executive intention to create long-term sustainable value
- Fewer than 10% of effective strategies formulated are executed just as effectively
- Problem is not the strategy, but the execution of the strategy
- This is because
 - Less than 5% of the workforce understands the strategy
 - Only 25% of managers have incentives linked to strategic intentions
 - Exec teams do not spend as much on strategy
 - Most organizations do not formally link budget to strategy, despite strategy driving budgets

So what is the Balanced Scorecard

- It is a management tool
- It is a communication tool
- It lays out the overall strategic direction and uber objectives and priorities of the company
- It identifies in broad stroke the key areas that contribute to the objectives
- It establishes appropriate metrics and protocols in those areas and provides managerial and resource support
- It monitors progress toward objectives
- Everything linked
 - Goals to Objectives
 - Objectives to Measurements
 - Measurements to Targets

BSC Perspective Model



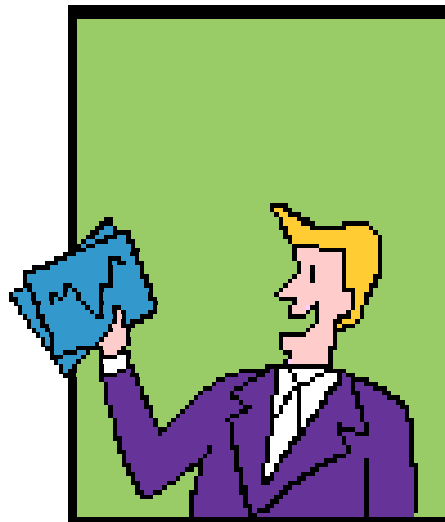
Sourcing & Distribution Theme	Measurement	Target	Initiative
Financial Profitability Revenue Growth	<ul style="list-style-type: none"> Operating Income Sales vs. Last Yr Same Store Sales Growth 	<ul style="list-style-type: none"> 20% Increase 12% Increase 12% Increase 	<ul style="list-style-type: none"> Likes Program
Customer Product Quality Shopping Experience	<ul style="list-style-type: none"> Return Rate <ul style="list-style-type: none"> Quality Other Customer Loyalty <ul style="list-style-type: none"> Ever Active % # units 	<ul style="list-style-type: none"> Reduce by 50% each yr 60% 2.4 units 	<ul style="list-style-type: none"> Quality Management Customer Loyalty
Internal "A" Class Factories Line Plan Management	<ul style="list-style-type: none"> % of Merchandise from "A" factories Items in-Stock vs. Plan 	<ul style="list-style-type: none"> 70% by year 3 85% 	<ul style="list-style-type: none"> Corporate Factory Development Program
Learning Factory Relationship Skills Merchandise Buying / Planning Systems	<ul style="list-style-type: none"> % of Strategic Skills Available Strategic Systems vs. Plan 	<ul style="list-style-type: none"> yr 1 50% yr 3 75% yr 5 90% 	<ul style="list-style-type: none"> Strategic Skills Plan Merchants Desktop

Module 7: Financial Accounting

- Financial Accounting
- Key Principles of Accounting
- Financial Statements
- Key Accounts and Accounting Cycle
- Ratios
- Things to Consider in Ratio Analysis

DEFINITION OF ACCOUNTING

Accounting is a *process* used to record *economic activities* of a *business organization* in order to generate *reports* for use by *decision makers*. (Similar to text on top of page 6)



Process - Systematic method. Objective. Many rules.

- Rules are created by the Financial Accounting Standards Board (FASB).



- Rules are called GAAP.
(Generally Accepted Accounting Principles)

- Publicly traded companies are also ruled by the Securities and Exchange Commission (SEC).



3 Types of *Business Activities* recorded in accounting

Financing

Investing

Operating

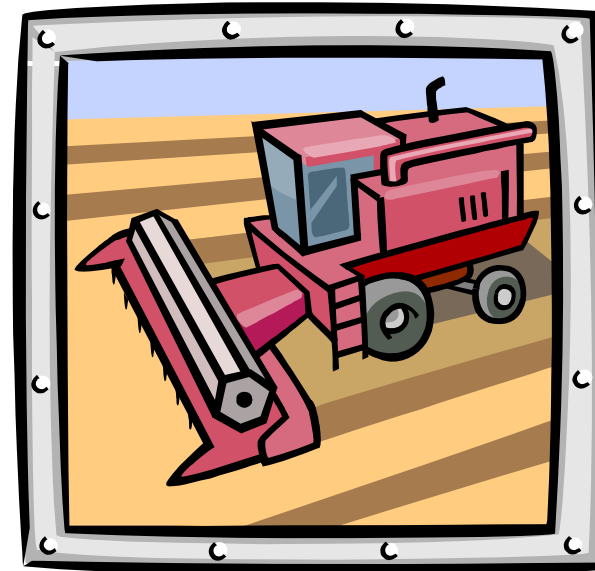
Operating Activities

- Primary activity of business
 - Selling goods
 - Providing services
 - Manufacturing
 - Cost of Sales
 - Advertising
 - Paying employees
 - Paying utilities



Investing Activities

- Obtaining resources or *assets* to operate the business
 - Land
 - Buildings
 - Vehicles
 - Computers
 - Furniture
 - Equipment



Financing Activities

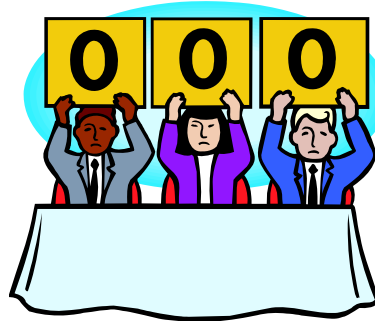


- Borrowing creates *liabilities*
 - Bank loans
 - Debt securities
 - Goods on credit or payables
- Selling stock creates *stockholders' equity*

4 *Reports* required by GAAP

- ❑ Income Statement (aka Profit & Loss)
- ❑ Statement of Retained Earnings
 - ❑ Balance Sheet
- ❑ Statement of Cash Flows

Income Statement



- Reports operating success or failure for a time period.
- Summarizes revenues and expenses for period: *month, quarter, year.*

Balance Sheet

- Specific date — *one point in time!*
- Reports assets and claims to assets.
 - Claims of:
 - creditors called **liabilities**.
 - owners called **stockholders' equity**.
- **Assets = Liabilities + Stockholders' Equity**

A common view is to reword to: **Assets - Debts = Net Worth**

Assets

- Resources owned by the business
 - Cash
 - Accounts receivable
 - Supplies
 - Inventories
 - Furniture and fixtures
 - Equipment



Liabilities

- Obligations or debts of business
 - Notes payable
 - Accounts payable
 - Interest payable
 - Salaries payable
 - Unearned revenue



Stockholders' Equity

- Ownership claims on assets
 - Paid-in capital
 - **Common stock**
 - Retained earnings



Statement of Cash Flows



- Provides information where a company gets cash and spends cash
- Summarizes for period: *month, quarter, year.*
- 3 groups: Cash from operating, investing, and financing activities.

Income Statement

SIERRA CORPORATION		
Income Statement		
For the Month Ended October 31, 2007		
Revenues		
Service revenue		\$10,600
Expenses		
Salaries expense	\$5,200	
Supplies expense	1,500	
Rent expense	900	
Insurance expense	50	
Interest expense	50	
Depreciation expense	40	
Total expenses		<u>7,740</u>
Net income		<u><u>\$ 2,860</u></u>

Balance Sheet

SIERRA CORPORATION
Balance Sheet
October 31, 2007

Assets

Cash		\$15,200
Accounts receivable		200
Advertising supplies		1,000
Prepaid insurance		550
Office equipment, net		<u>4,960</u>
Total assets		<u><u>\$21,910</u></u>

Liabilities and Stockholders' Equity

Liabilities		
Notes payable	\$ 5,000	
Accounts payable	2,500	
Interest payable	50	
Unearned revenue	800	
Salaries payable	<u>1,200</u>	
Total liabilities		\$ 9,550
Stockholders' equity		
Common stock	10,000	
Retained earnings	<u>2,360</u>	
Total stockholders' equity		<u>12,360</u>
Total liabilities and stockholders' equity		<u><u>\$21,910</u></u>

Statement of Cash Flows

SIERRA CORPORATION
Statement of Cash Flows
For the Month Ended October 31, 2007

Cash flows from operating activities		
Cash receipts from operating activities	\$11,200	
Cash payments for operating activities	<u>(5,500)</u>	
Net cash provided by operating activities		\$ 5,700
Cash flows from investing activities		
Purchased office equipment	<u>(5,000)</u>	
Net cash used by investing activities		(5,000)
Cash flows from financing activities		
Issuance of common stock	10,000	
Issued note payable	5,000	
Payment of dividend	<u>(500)</u>	
Net cash provided by financing activities		<u>14,500</u>
Net increase in cash		15,200
Cash at beginning of period		<u>0</u>
Cash at end of period		<u><u>\$15,200</u></u>

Agrees
with
Balance
Sheet

Internal Users Ask?

Questions Asked by Internal Users



Finance

Is cash sufficient to pay dividends to **Microsoft** stockholders?



Marketing

What price for an **Apple** iPod will maximize the company's net income?



Human Resources

Can we afford to give **General Motors** employees pay raises this year?



Management

Which **PepsiCo** product line is the most profitable?
Should any product lines be eliminated?

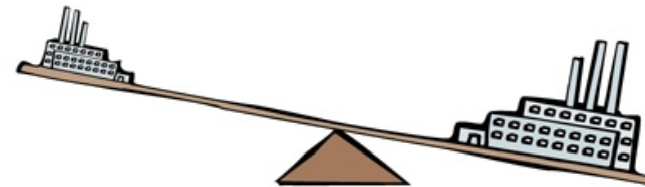
External Users Ask?

Questions Asked by External Users



Investors

Is General Electric earning satisfactory income?



Investors

How does **Disney** compare in size and profitability with **Time Warner**?



Creditors

Will **United Airlines** be able to pay its debts as they come due?





Annual Report

Required by the SEC
(for publicly traded companies only)

- Includes:
 - Financial Statements
 - Management Discussion and Analysis
 - Notes to Financial Statements
 - Auditor's Report

Auditor's Report

- Only issued by Certified Public Accountant – CPA
- Auditor (CPA) conducts independent examination of financial statements
- Evaluates if statements are a fair representation of business operations
- Certifies that statements follow GAAP
- The Big 4
 - Price Waterhouse Coopers
 - KPMG
 - Deloitte & Touche
 - Ernst & Young

Auditor's Report



TOOTSIE ROLL INDUSTRIES, INC. Excerpt from Auditor's Report

To the Board of Directors and Shareholders of Tootsie Roll Industries, Inc.

In our opinion, the accompanying consolidated balance sheets and the related consolidated statements of earnings, comprehensive earnings, retained earnings, and cash flows present fairly, in all material respects, the financial position of Tootsie Roll Industries, Inc. and its subsidiaries at December 31, 2004 and 2003, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2004, in conformity with accounting principles generally accepted in the United States of America.

A Classified Balance Sheet...

Generally contains the following standard classifications:

- Current Assets
- Long-Term Investments
- Property, Plant, and Equipment
- Intangible Assets
- Current Liabilities
- Long-Term Liabilities
- Stockholders' Equity

} ASSETS

} LIABILITIES

CHUCK CORPORATION

Balance Sheet

December 31, 2008

Subtotals are usually made for current items:

Assets

Current Assets:

Cash		\$ 2,000
Accounts receivable		<u>4,000</u>
Total Current Assets		\$ <u>6,000</u>

Equipment	24,000	
Less: Accumulated Depreciation	<u>8,000</u>	<u>16,000</u>
Total assets		\$22,000

Long-Term Investments

- Assets that can be converted into cash, but whose conversion is not expected within one year.
- Assets not intended for use within the business.
- Examples:
 - investments of stocks and bonds of other corporations.
 - Land held for speculation



PP&E recording rules . . .

- Record and keep on balance sheet the **COST** of the asset (NOT value).
- **Expense** asset's purchase price **by allocating** cost over a number of years instead of expensing full cost in year of purchase.
- **Depreciation** expense is recorded each year on most long lived assets used in a business.

CHUCK CORPORATION

Balance Sheet

December 31, 2008

PP&E should be shown at cost less accumulated depreciation

Assets

Current Assets:

Cash \$ 2,000

Accounts receivable 4,000

Total Current Assets \$ 6,000

Equipment 24,000

Less: Accumulated Depreciation 8,000 16,000

Total assets \$22,000

Accumulated Depreciation

- Shows the **total** amount of depreciation expense taken over the life of the asset.
- Appears on the **balance sheet** as a negative adjustment to PP&E cost.

Intangible Assets

- Like PP&E, usually have long useful life
- Have no physical substance
- Examples:
 - patents
 - copyrights
 - trademarks or trade names
 - Franchise
 - Goodwill

Current Liabilities

Obligations that are supposed to be paid within the coming year...

- accounts payable
- wages payable
- bank loans payable
- interest payable
- taxes payable
- current maturities of long-term bank loans payable



Long-Term Liabilities

Debts expected to be paid after one year

Examples...

- bonds payable
- mortgages payable
- long-term notes payable
- obligations under employee pension plans

Stockholders' Equity

- **Common stock** - investments in the business by the stockholders
- **Retained earnings** - earnings kept for use in the business

Ratio Analysis

- ↓ Uses relationships on statements to evaluate a company.
- ↓ 3 groups of ratios are intended to indicate different things.
 - ↓ Profitability
 - ↓ Liquidity
 - ↓ Solvency

The Accounting Information System

The system of:

- Collecting, organizing and processing transaction data
- Transaction is an event that results in a change of a balance sheet item.
- Typically it is an exchange.

(Asset, liability, stock, revenue or expense for one another.)

Steps in transaction analysis:

Accumulate facts regarding a *business event*.

- Determine effects on accounting equation

$$\text{Assets} = \text{Liabilities} + \text{Stockholders' Equity}$$

Note: Algebra requires that you keep the equality!

Transaction Analysis

- **Two or more** items will always be affected
- Example: (1) Owner invested \$10,000 Cash in exchange for \$10,000 of Common Stock

	<u>Assets</u>	=	<u>Liabilities</u>	+	<u>Stockholders' Equity</u>	
	Cash	=			Common Stock	
(1)	+\$10,000	=			+\$10,000	Issued stock

Account...

- Lowest level of detail in accounting.
- Records increases and decreases for a specific **Asset, Liability, or Stockholders' Equity** item.
- Number of accounts used depends on facts and personal desires of the accountant & management.

How much detail do they want on the financial statements?

- ACCOUNTING MATHEMATICS

- Algebra is the foundation.

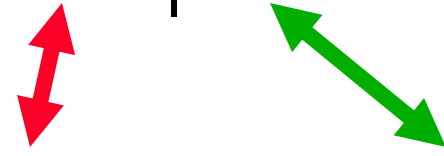
- The *accounting equation*:

<u>ASSETS</u>		=	<u>LIABILITIES</u>		+	<u>EQUITY</u>		.
debit	credit		debit	credit		debit	credit	
+	-		-	+		-	+	

+ means increase balance

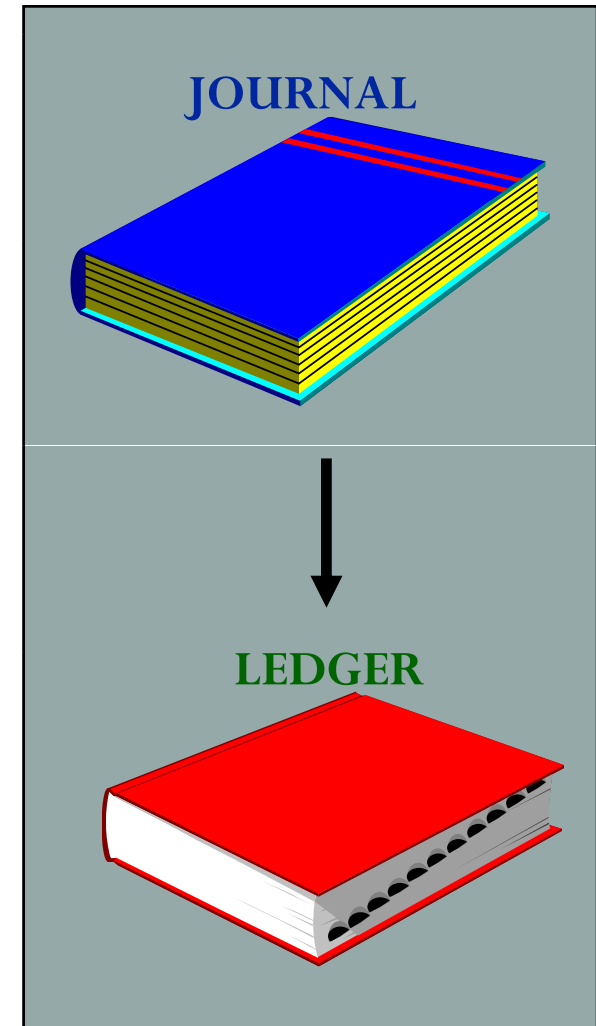
- means decrease balance

<u>EXPENSES</u>		<u>REVENUES</u>	
debit	credit	debit	credit
+	-	-	+



The “BOOKS” in accounting

- **General Journal** - Book used to record transactions *before* recording them in the accounts.
 - Listing of transactions by date.
- **General Ledger** – **Binder of all the accounts.** (T or ledger format)
 - Table of contents to the general ledger is called the “Chart of Accounts”
- Information ends up being *recorded twice*. It’s just organized differently.
- Process of copying transactions from journal to ledger is called *POSTING*



Example: Use of ledger and journal

CASH IN CHECKING

50.00	
100.00	50.00
60.00	15.00
250.00	1000.00
300.00	
510.00	
1270.00	1065.00

What did we buy?

Look at journal entry

<u>Date</u>	<u>Accounts</u>	<u>Debits</u>	<u>Credits</u>
9/12	Computers		700.00
	Supplies	300.00	
	Cash		1000.00

(Purchased Laser printer & toner cartridges from Office Depot)

The Accounting Information System REVISITED AGAIN

1. Accumulate facts on events, determine effects on the accounting equation, accounts to be used, debits and credits
2. Journalize (usually done daily)
3. Post to Ledger (often batched, daily or weekly)
4. Total all accounts in ledger and check math for errors.
5. Total Debits = Total Credits (called trial balance).

	<u>Debit</u>	<u>Credit</u>
Cash	100	
Equipment	500	
Accounts Payable		200
Retained Earnings		400
Revenue		200
Wage Expense	<u>200</u>	<u> </u>
	800	800

Time Period Assumption

- Divides the economic life of a business into reporting (time) periods.
- Generally a month, a quarter, semi-annual or a year.
- An accounting time period that is one year long is called *fiscal year*.
- A fiscal year ending December 31 is called a calendar year.

Accounting Method

- **Determines which time period revenues and expenses are recorded.**

For example, when I sell something in December but get paid the cash in January, which income statement should show the revenue, December's or January's?

- **Two general methods exist:**
 - **Cash Basis**
 - **Accrual Basis**

Accrual Basis

- **Defined:**

Record revenues when earned.

- (when goods are sold or services performed)
- Called *Revenue Recognition Principle*

Record expenses when incurred.

- (*When they were used up to produce revenue*)
- Called *Matching Principle*.

- Requires **adjustments** and additional **accounts**.

Accrual Basis Example

EXAMPLE: Magazine Inc sells only **3 year** subscriptions for \$60 each.

- On 1/1/08 sold 10,000 subscriptions and received full **payment of \$600,000.**
- Wages, rent, and miscellaneous operating expenses incurred and paid are **\$50,000 per year.**
- On 1/1/08, a special deal came along and the company bought \$200,000 of paper which should be enough to complete the 10,000 subscriptions for 2 years.

Compute net income for 2008 and 2009 using cash method and then using accrual method.

Accrual Basis & Cash Basis Impact

<u>Cash Method:</u>	<u>2008</u>	<u>2009</u>
Revenues	600,000	0
Oper Exp	- 50,000	- 50,000
Paper Exp	<u>-200,000</u>	<u>- 0</u>
Net Income	350,000	- 50,000

<u>Accrual:</u>	<u>2008</u>	<u>2009</u>
Revenues	200,000	200,000
Oper Exp	- 50,000	- 50,000
Paper Exp	<u>-100,000</u>	<u>- 100,000</u>
Net Income	50,000	50,000

Adjusting Journal Entries (AJEs)

- Are needed only for the accrual method
- Are used to handle inter-period **timing** issues
- **Split up** a revenue or expense (when needed) and record part of it in one accounting period and the rest of it in a later period.

For example, in the previous example 1/3 of the revenue and 1/2 of the paper.

- *Getting revenues and expenses in the correct accounting periods is referred to as achieving a proper “Cut-Off” of the accounting period.*

Types of Adjusting Entries

- **Advance receipts or payments**
 - Unearned Revenues: receive cash
 - Prepaid expenses: pay cash
- **Delayed receipts or payments**
 - Accrued revenues: earn revenue
 - Accrued expenses: used resources

CLOSING ENTRIES



***permanent
or
temporary.***

Permanent Accounts



- **Also called *Real* accounts**
- **Consist of all balance sheet accounts**
- **Beginning balances are needed to
arrive at ending balances**
- **DO NOT get closed**

Temporary Accounts

- **Also called *nominal* accounts**
- **Consist of all income statement accounts and a few more**
- **Have a temporary life = 1 accounting period**
- **Are closed (zeroed out) at the end of each accounting period**

The CLOSING PROCESS

PURPOSE:

-  ***Set the stage*** for the next accounting cycle.
(Revenue & Expense accounts will contain info for the next period only).
-  ***Summarize*** income and expenses for the period just past and ***record*** this result in the **RETAINED EARNINGS** account.

TIMING:

Performed just ***after*** the period end. (after adjusting entries)

Required Steps in the Accounting Cycle

1. *Analyze business transactions.*
2. *Journalize the transactions.*
3. *Post to ledger accounts.*
4. *Prepare a trial balance.*
5. *Journalize and post adjusting entries.*
6. *Prepare an adjusting trial balance.*
7. *Prepare financial statements*
8. *Journalize and post closing entries*
9. *Prepare a post closing trial balance*

Management and Receivable Issues

Receivables often viewed as necessary evils of business

- Receivables hinder cash flow and extend the operating cycle.
- Cash is better, but competition, marketing, consumer's buying habits and economic conditions make sales on credit critical to generating revenues!



Methods to manage receivables

5. Monitor collections. Establish policy for overdue accounts. Helpful ratios include:

a) A/R Turnover =
$$\frac{\text{Net Credit Sales}}{\text{Average A/R}}$$

Relates to how fast cash is collected.

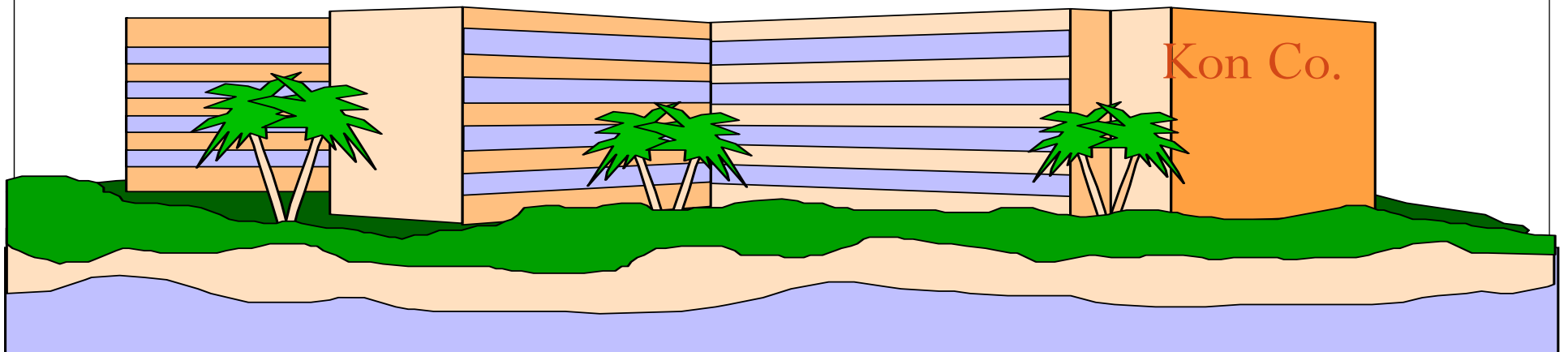
- b) Average Collection Period (age of receivables) in days equals: 365 days / receivables turnover.

Usually, high turnover is good. Means less money is tied up in receivables, better cash flow.

Property, Plant & Equipment (PP&E)

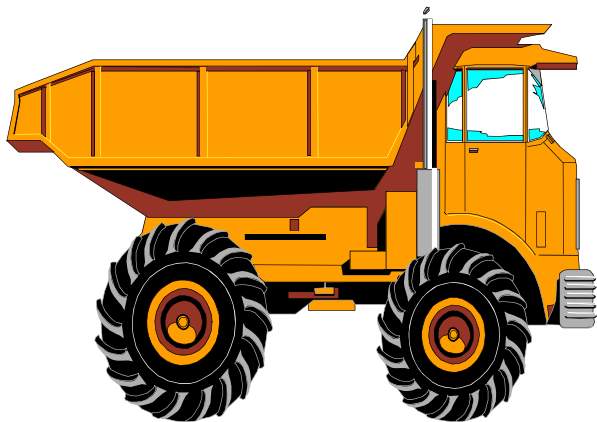
Includes all

- long lived **tangible** assets (*physical substance*)
- **used** in operation of **business** (*not just for investment*)
- not intended for sale to customers



GAAP rules and issues regarding PP&E:

- Record at cost.
 - COST = **all** expenditures to *acquire* an asset and get it *in place* and *ready for use*.
 - Improvements (**called capital expenditures**) are added to the asset account. *Extend life, efficiency or capacity*
 - Repairs, maintenance and recurring costs are expensed immediately. *Called revenue expenditures.*

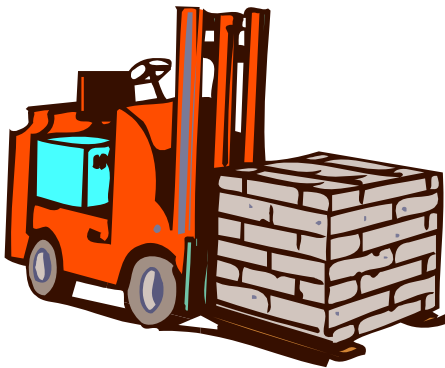


GAAP rules and issues regarding PP&E:

- Stays on balance sheet at cost, *not value*.

One exception, if permanent decline (impairment)
then write down to market value.

- Spread cost over useful life to **depreciation expense**.
Exception, land has unlimited life, so no depreciation.
- **Gain or loss** will be recorded when disposed.



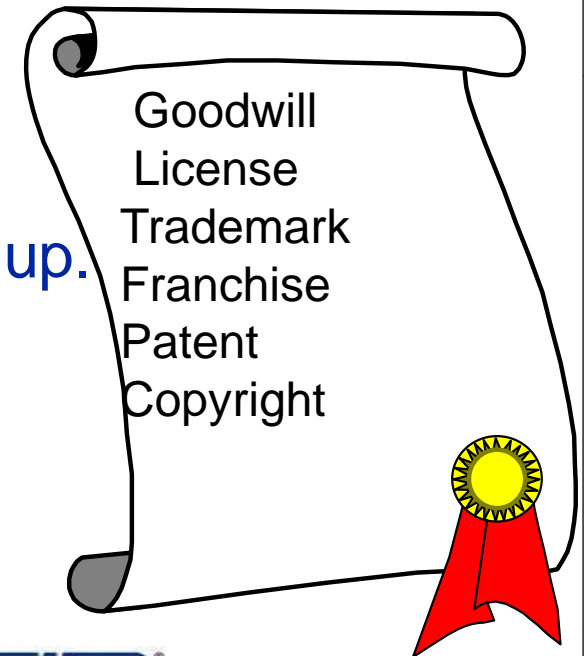
Intangible Assets

Text p.441

- ❑ Consist of legal rights and processes, name recognition, patient lists, contracts, licenses, etc.
- ❑ GAAP requires **development (research) cost** to be treated as expense. (**Not capitalized!**)

- Theory is its impossible to track
how much results in asset or is used up.

*Example advertising, trial and error
product research.*



□ **Goodwill** equals the excess of the purchase price of an ongoing business over the value of the net assets. **text p.444**

- Sometimes viewed as the value of the ability of the business to generate future profits.
- Similar to other intangibles, capitalize only if purchased.
- No amortization since indeterminable life.

Impairment rule is used.

Example: Pay \$1,200,000 for restaurant.

Appraisal of inventory, equipment, receivables and all other assets totals \$700,000.

Goodwill = (\$1,200,000 - \$700,000) = \$500,000.

MISCELLANEOUS ISSUES

Return On Assets Ratio *text p 437*

Reveals the amount of income generated by each asset dollar.

$$\text{Return on Assets Ratio} = \frac{\text{Net Income}}{\text{Average Assets}^*}$$



Higher value suggests favorable efficiency.

* Average = Beginning + ending / 2

Liabilities

- Claims on total assets
- Obligations to employees (current and retired), governments, suppliers, banks and financiers, law suit settlements, customers, etc.
- “Current” if due within 1 year

Comparison of issuing bonds vs issuing stock

BONDS

Considered Liability.

Bond principal must be paid back.

Interest **must be paid**.

Interest is tax deductible.
Expense on statements.

Bond investors have **no say** in running company.

Bonds investors are **gone** when paid.

STOCK

Considered Equity.

Corp not committed to redeem stock.

Dividends are **optional**.

Dividends paid **aren't an expense** or deductible.

Stockholders **vote** for Board of directors

Stockholders are **permanent** owners.

Other Issues - Contingent Liabilities

- **Are events with uncertain outcomes.**
Lawsuits, money back guaranties, mail in rebates
- **GAAP rule: Must be recorded as a liability if:**
 - the company can determine a reasonable estimate of the expected loss and
 - it is **probable** it will occur.
- **Otherwise, mention in footnotes**



Other Issues - Lease Liabilities

Operating Lease: Also see chapter 9 discussion.

- Treated as a true lease. Nothing on the balance sheet, only rent expense on the income statement.
- Companies sometimes prefer operating lease treatment because they don't want the liability on their balance sheet.
- Called "OFF BALANCE SHEET FINANCING"

Sales & Cost of Goods Sold (COGS)

- **Revenue Recognition Principle requires revenue be recorded at point of sale.**
 - When “legal ownership” changes from seller to buyer.
 - Goods must be transferred to buyer (shipped).
- **Matching Principle also requires the expense of the sale be recorded at the same time as revenue**

CORPORATE STOCK

- Stock must be authorized by state for sale.
- Issued stock was sold, given or traded to shareholders.
- Outstanding means someone owns the stock.
- Stock bought back from stockholders is treasury stock.

CORPORATE STOCK

- **PREFERRED STOCK (P/S):**
 - Optional class of stock.
 - Preferential treatment over C/S:
 - Receive Liquidation assets before c/s.
 - Dividends received before c/s.
 - If Cumulative, current unpaid dividends accumulate to be paid in the future. (called “dividends in arrears”)
- Usually LARGE Par, FIXED dividend rate

TREASURY STOCK

- Stock issued, then reacquired by corp.
- Buy out unhappy or retiring shareholders
- Use excess cash to reduce equity owners.
- Fewer shareholders to deal with, maximize EPS.
- Increase or decrease take-overs.
- Mergers, acquisitions, buy-outs
- Not an asset. Contra-Equity.

DIVIDENDS

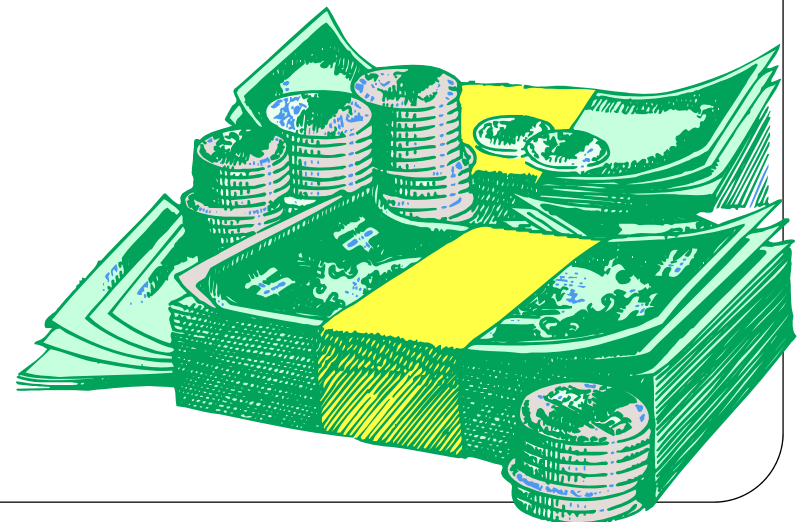
- Distributions to shareholders
 - Cash
 - Additional stock (common or preferred)
 - Other assets (excess inventory, personal use of corporate assets)
- Must be declared (announced) by BOD.
 - Becomes a liability on declaration
- Taxable income to shareholders, not deductible by corporations.
 - Except stock dividends aren't taxable

Questions for Statement of Cash Flow

Where did the cash come from?

What was the cash used for?

Source of Operating Cash



Format of the Statement of Cash Flows

Four parts (called activities):

- Operating - Cash from sales less cash spent on expenses
 - 2 options: direct or indirect
- Investing - Cash in and out from buying and selling of balance sheet items
- Financing - Cash in from borrowing or stock issue less cash out from paying back debt, buying treasury stock or paying dividends

Free Cash Flow

Cash Provided By Operations

– Capital Expenditures

– Dividends Paid

Free Cash Flow

- Considered excess cash available after spending to maintain operational efficiency and shareholders satisfied.



Earnings power of a company:

- is best use of past data to forecast profitability.
- is the ability to generate future profits.
- comes from recurring items such as:
 - **net income from operations**
 - **recurring non-operating items** (such as investment income or interest expense)
- Called “Sustainable” income.
- need to separate out non-recurring *irregular items*.

Three basic tools are used in financial statement analysis :

- Horizontal analysis
- Vertical analysis
- Ratio analysis



Liquidity Ratios



Measure the short-term ability of the enterprise to pay its maturing obligations and to meet unexpected needs for cash.

WHO CARES?

Short-term creditors such as bankers and suppliers

Liquidity Ratios

Liquidity Ratios

Working capital	$\text{Current assets} - \text{Current liabilities}$
Current ratio	$\frac{\text{Current assets}}{\text{Current liabilities}}$
Current cash debt coverage ratio	$\frac{\text{Cash provided by operations}}{\text{Average current liabilities}}$
Inventory turnover ratio	$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$
Days in inventory	$\frac{365 \text{ days}}{\text{Inventory turnover ratio}}$
Receivables turnover ratio	$\frac{\text{Net credit sales}}{\text{Average net receivables}}$
Average collection period	$\frac{365 \text{ days}}{\text{Receivables turnover ratio}}$

Solvency Ratios

Measure the ability of the enterprise to survive over a long period of time

WHO CARES?

Long-term creditors and stockholders



Solvency Ratios

Solvency Ratios

Debt to total assets ratio

$$\frac{\text{Total liabilities}}{\text{Total assets}}$$

Cash debt coverage ratio

$$\frac{\text{Cash provided by operations}}{\text{Average total liabilities}}$$

Times interest earned ratio

$$\frac{\text{Net income} + \text{Interest expense} + \text{Tax expense}}{\text{Interest expense}}$$

Free cash flow

$$\text{Cash provided by operations} - \text{Capital expenditures} - \text{Cash dividends}$$

Profitability Ratios

Measure the income or operating success of an enterprise for a given period of time

WHO CARES? Everybody

WHY? A company's income affects:

- its ability to obtain debt and equity financing
- its liquidity position
- its ability to grow

Profitability Ratios

Profitability Ratios

Earnings per share

$$\frac{\text{Net income} - \text{Preferred stock dividends}}{\text{Average common shares outstanding}}$$

Price-earnings ratio

$$\frac{\text{Stock price per share}}{\text{Earnings per share}}$$

Gross profit rate

$$\frac{\text{Gross profit}}{\text{Net sales}}$$

Profit margin ratio

$$\frac{\text{Net income}}{\text{Net sales}}$$

Return on assets ratio

$$\frac{\text{Net income}}{\text{Average total assets}}$$

Asset turnover ratio

$$\frac{\text{Net sales}}{\text{Average total assets}}$$

Payout ratio

$$\frac{\text{Cash dividends declared on common stock}}{\text{Net income}}$$

Return on common
stockholders' equity ratio

$$\frac{\text{Net income} - \text{Preferred stock dividends}}{\text{Average common stockholders' equity}}$$

Corporate Finance

- Operating Activities
- Investing Activities
- Financing Activities

Module 8: Financial Asset Management

- What is working capital?
- How do you finance assets?
- How do you manage cash?
- What are trade floats?

Working Capital

- Current Assets
- Current Liabilities
- Current Assets – Current Liabilities
- As the Company grows, more working capital is needed
- You get working capital through
 - Debt financing
 - Issuing Equity
 - Other Source of Operating Funds

Cash Management

- Critical to working capital management
- Need to know how much cash is needed and when
- Implement appropriate cash controls
- Investment of excess cash and underlying investment policy
- How much cash to hold
 - Cash Management Policy
 - Debt Maturity
 - Ability to borrow
 - Forecasted long term and short term needs
 - Risk/Return of investments
 - Probabilities of Cash flow assessments

Cash Management

- Cash in Bank
- Factoring Assets
- Sales-Buyback Agreements
- Money Market Securities
- Treasury Bills
- Certificates of Deposits
- Commercial Paper
- Repurchase agreements in government securities
- Banker's acceptances – international trade
- Line of Credit
 - Working Capital Line
 - Equipment Line of Credit
- Restricted Cash

Accelerate Cash Receipts and Delay Cash Payments

Cash Velocity

- How quickly are you realizing cash from your operations
- $\text{Cash Velocity} = \text{DSO (Days Sales Outstanding)} - \text{DPO (Days Payable Outstanding)}$
- Negative Cash Velocity is good.
- Means that you are getting cash faster than paying out cash.
- If you sustain negative cash velocity, with net positive operating margins, you can sustain the company without securing debt or equity
- $\text{DSO} = \text{Accounts Receivable} / \text{Credit Sales} * \text{Number of Days}$
- $\text{DPO} = \text{Accounts Payable} / \text{Cost of Sales} * \text{Number of Days}$

Module 9: Credit and Receivables

- Receivable Management
- Credit Policies
- Factoring
- Secured Receivables
- Contract Management

Credit Policies

- Credit Policy is important
- Customers assessed based on their credit history
- General reference point is D&B or/and trade references
- Credits increased or decreased based on
 - Size of the customer
 - Reputation of the customer
 - Contracts
 - Payment history
- Increasing credit increases risk but also increases sales
- Important to balance out risk vs. sales
- Depending on industry – you want to ensure that receivables are kept on average below 45 days max.

Accounts Receivable Policy

- Accounts Receivables are booked on billings
- Important to get billings out soon
- Some companies give discounts against early payments
- 2/n10 means 2% discount if paid in 10 days from invoice date
- Billings must be accurate
- Contracts may perfect and secure an AR
- Factoring maybe a policy
 - Sell the AR to a third-party at a discount
 - Expedites cash
 - Extremely expensive

AR Metrics

- Days Sales Outstanding = $AR / \text{Credit Sales} * \text{Number of Days}$
- AR Turnover = $\text{Annual Number of Days} / \text{Avg. Collection Period}$
- Average AR balance = $\text{Credit Sales} / \text{Turnover}$
- Average Investment in AR = $\text{Avg. Receivables} * \text{Cost of Sales \%}$

Chapter 10:

The Basics of Capital Budgeting: Evaluating Cash Flows

- Overview and “vocabulary”
- Methods
 - Payback, discounted payback
 - NPV
 - IRR, MIRR
 - Profitability Index
- Unequal lives
- Economic life

What is capital budgeting?

- Analysis of potential projects.
- Long-term decisions; involve large expenditures.
- Very **important** to firm's future.

Steps in Capital Budgeting

- Estimate cash flows (inflows & outflows).
- Assess risk of cash flows.
- Determine $r = \text{WACC}$ for project.
- Evaluate cash flows.

What is the difference between independent and mutually exclusive projects?

Projects are:

independent, if the cash flows of one are unaffected by the acceptance of the other.

mutually exclusive, if the cash flows of one can be adversely impacted by the acceptance of the other.

What is the payback period?

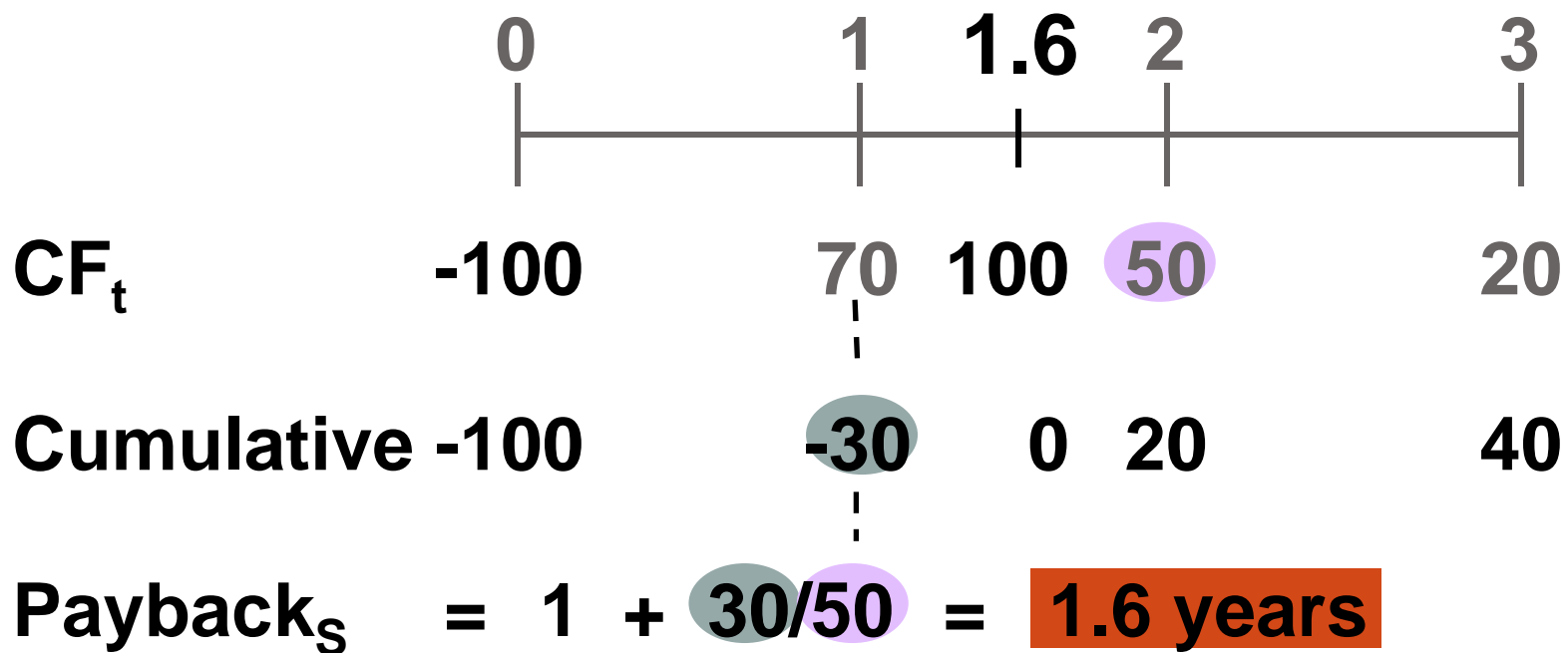
The number of years required to recover a project's cost,

or how long does it take to get the business's money back?

Payback for Franchise L (Long: Most CFs in out years)

	0	1	2	2.4	3
CF_t	-100	10	60	100	80
Cumulative	-100	-90	-30	0	50
Payback _L	= 2	+	30/80	=	2.375 years

Franchise S (Short: CFs come quickly)



Strengths of Payback:

1. Provides an indication of a project's **risk** and **liquidity**.
2. **Easy to calculate** and understand.

Weaknesses of Payback:

1. Ignores the **TVM**.
2. **Ignores CFs** occurring after the payback period.

Discounted Payback: Uses discounted rather than raw CFs.

	0	1	2	3
		10%		
CF_t	-100	10	60	80
$PVCF_t$	-100	9.09	49.59	60.11
Cumulative	-100	-90.91	-41.32	18.79
Discounted payback	= 2	+ 41.32/60.11	= 2.7 yrs	

Recover invest. + cap. costs in 2.7 yrs.

NPV: Sum of the PVs of inflows and outflows.

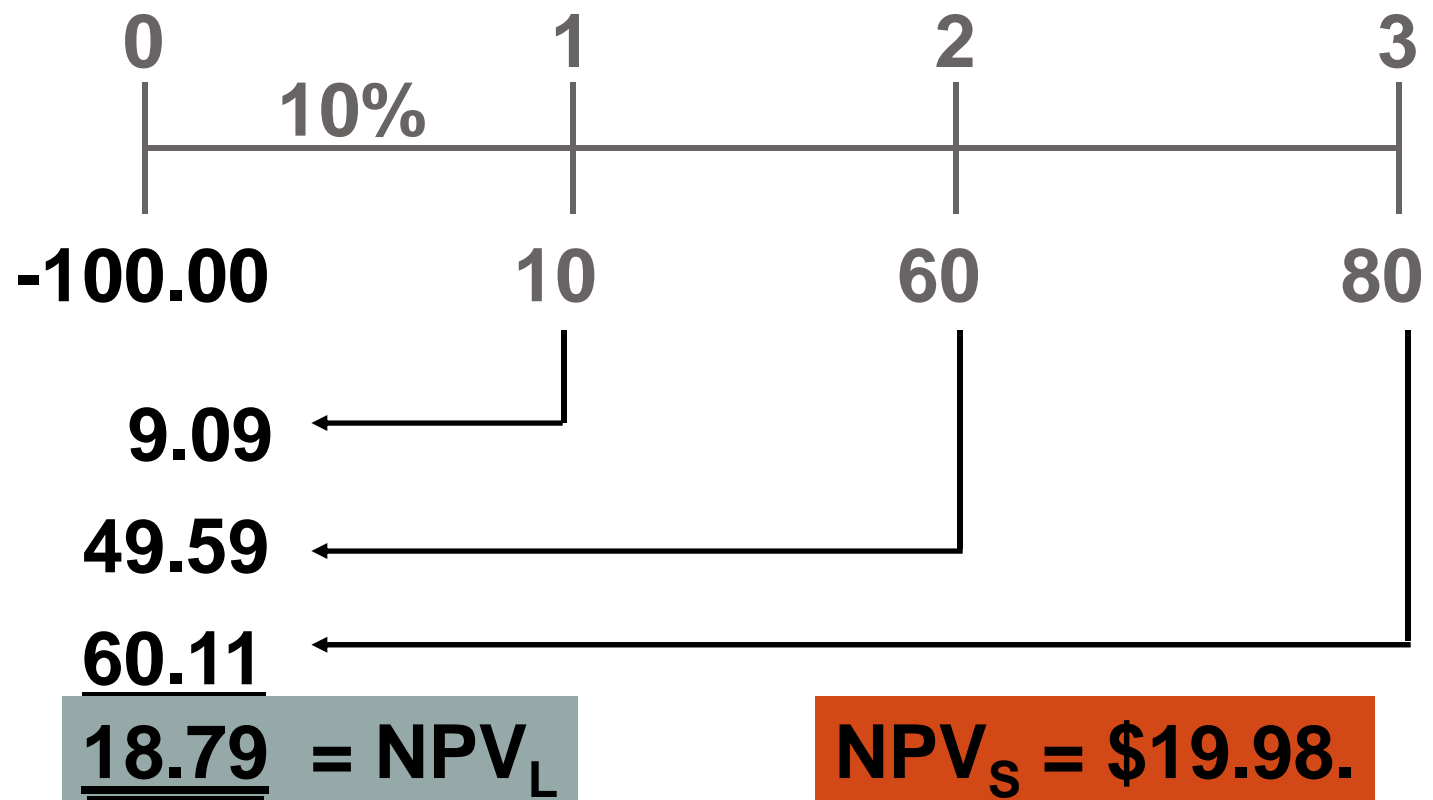
$$NPV = \sum_{t=0}^n \frac{CF_t}{(1+r)^t}.$$

Cost often is CF_0 and is negative.

$$NPV = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} - CF_0.$$

What's Franchise L's NPV?

Project L:



Rationale for the NPV Method

$$\begin{aligned}\text{NPV} &= \text{PV inflows} - \text{Cost} \\ &= \text{Net gain in wealth.}\end{aligned}$$

Accept project if $\text{NPV} > 0$.

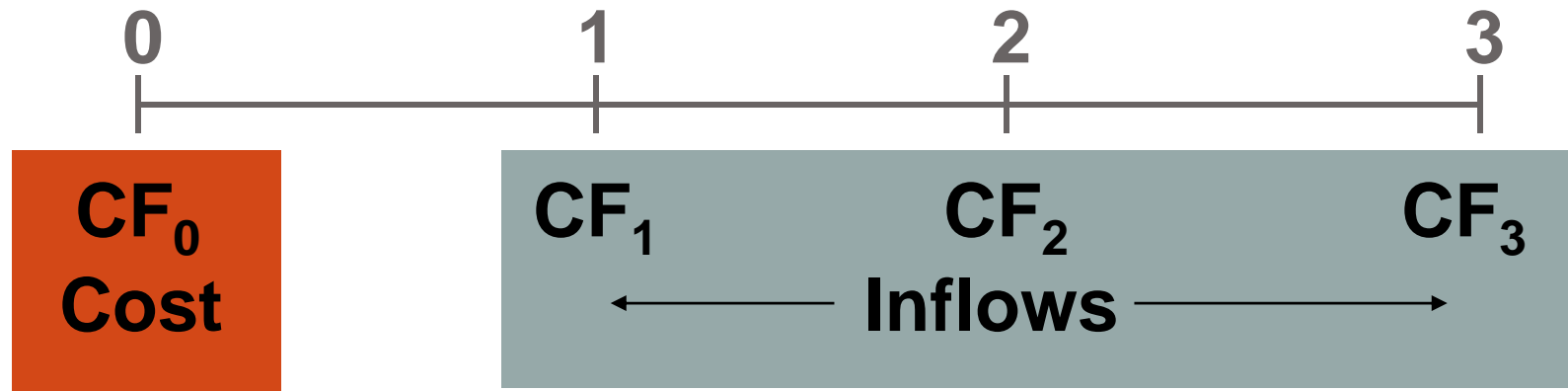
Choose between mutually exclusive projects on basis of higher NPV. Adds most value.

Using NPV method, which franchise(s) should be accepted?

- If Franchise S and L are mutually exclusive, accept S because $NPV_s > NPV_L$.
- If S & L are independent, accept both; $NPV > 0$.



Internal Rate of Return: IRR



IRR is the discount rate that forces PV inflows = cost. This is the same as forcing NPV = 0.

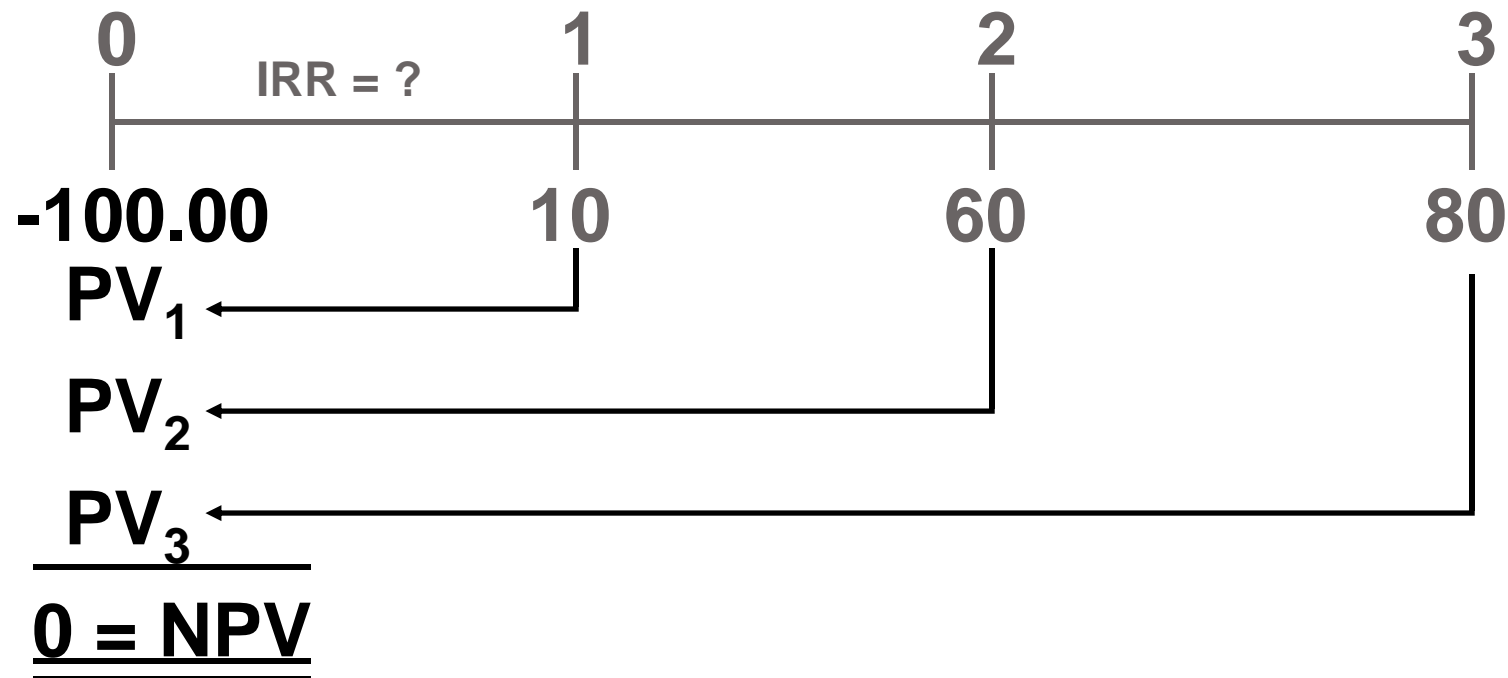
NPV: Enter r , solve for NPV.

$$\sum_{t=0}^n \frac{CF_t}{(1+r)^t} = NPV .$$

IRR: Enter NPV = 0, solve for IRR.

$$\sum_{t=0}^n \frac{CF_t}{(1+IRR)^t} = 0 .$$

What's Franchise L's IRR?



Enter CFs in CFLO, then press IRR:

$$IRR_L = 18.13\% \quad IRR_S = 23.56\%$$

Decisions on Projects S and L per IRR

- If S and L are independent, accept both. $IRR_S > r = 10\%$.
- If S and L are mutually exclusive, accept S because $IRR_S > IRR_L$.

Rationale for the IRR Method

If $IRR > WACC$, then the project's rate of return is greater than its cost-- some return is left over to boost stockholders' returns.

**Example: $WACC = 10\%$, $IRR = 15\%$.
Profitable.**

Find IRR if CFs are constant:



INPUTS

3

N

I/YR

-100

PV

40

PMT

0

FV

OUTPUT

9.70%

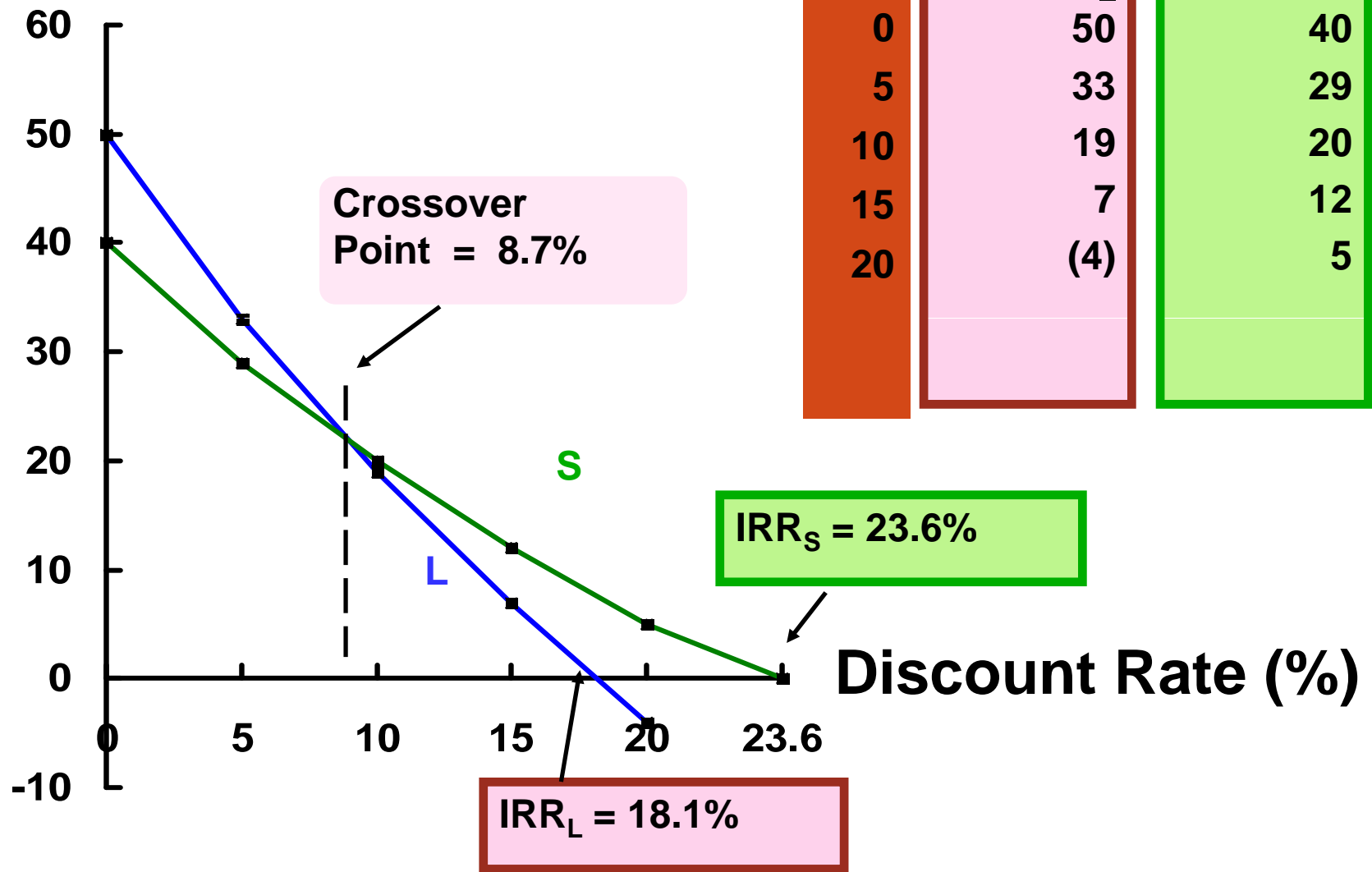
**Or, with CFLO, enter CFs and press
IRR = 9.70%.**

Construct NPV Profiles

Enter CFs in CFLO and find NPV_L and NPV_S at different discount rates:

<u>r</u>	<u>NPV_L</u>	<u>NPV_S</u>
0	50	40
5	33	29
10	19	20
15	7	12
20	(4)	5

NPV (\$)



Crossover Point = 8.7%

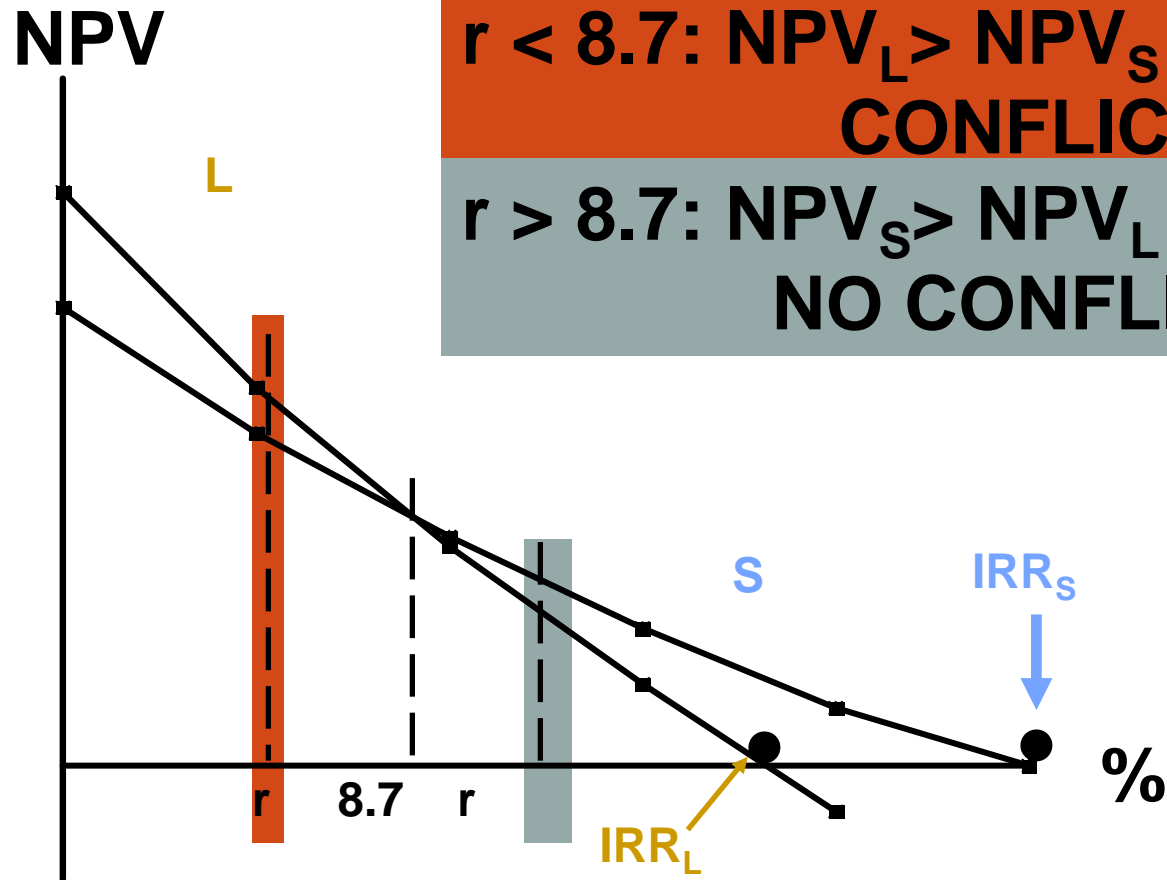
r	NPV_L	NPV_S
0	50	40
5	33	29
10	19	20
15	7	12
20	(4)	5

IRR_S = 23.6%

IRR_L = 18.1%

Discount Rate (%)

Mutually Exclusive Projects



$r < 8.7$: $NPV_L > NPV_S$, $IRR_S > IRR_L$
CONFLICT

$r > 8.7$: $NPV_S > NPV_L$, $IRR_S > IRR_L$
NO CONFLICT

To Find the Crossover Rate

- 1. Find cash flow differences between the projects. See data at beginning of the case.**
- 2. Enter these differences in CFLO register, then press IRR. Crossover rate = 8.68%, rounded to 8.7%.**
- 3. Can subtract S from L or vice versa, but better to have first CF negative.**
- 4. If profiles don't cross, one project dominates the other.**

Two Reasons NPV Profiles Cross

1. **Size (scale) differences.** Smaller project frees up funds at $t = 0$ for investment. The higher the opportunity cost, the more valuable these funds, so high r favors small projects.
2. **Timing differences.** Project with faster payback provides more CF in early years for reinvestment. If r is high, early CF especially good, $NPV_S > NPV_L$.

Reinvestment Rate Assumptions

- NPV assumes reinvest at r (opportunity cost of capital).
- IRR assumes reinvest at IRR.
- Reinvest at opportunity cost, r , is more realistic, so NPV method is best. NPV should be used to choose between mutually exclusive projects.

Managers like rates--prefer IRR to NPV comparisons. Can we give them a better IRR?

Yes, **MIRR** is the discount rate which causes the PV of a project's terminal value (TV) to equal the PV of costs. TV is found by compounding inflows at WACC.

Thus, MIRR assumes cash inflows are reinvested at WACC.

Choosing the Optimal Capital Budget

- Finance theory says to accept all positive NPV projects.
- Two problems can occur when there is not enough internally generated cash to fund all positive NPV projects:
 - An increasing marginal cost of capital.
 - Capital rationing

Increasing Marginal Cost of Capital

- Externally raised capital can have large flotation costs, which increase the cost of capital.
- Investors often perceive large capital budgets as being risky, which drives up the cost of capital.
- If external funds will be raised, then the NPV of all projects should be estimated using this higher marginal cost of capital.

Capital Rationing

- Capital rationing occurs when a company chooses not to fund all positive NPV projects.
- The company typically sets an upper limit on the total amount of capital expenditures that it will make in the upcoming year.

Reason: Companies want to avoid the direct costs (i.e., flotation costs) and the indirect costs of issuing new capital.

Solution: Increase the cost of capital by enough to reflect all of these costs, and then accept all projects that still have a positive NPV with the higher cost of capital.

OUTLINE

- Introduction
- Cost of Capital - General
 - Required return v. cost of capital
 - Risk
 - WACC
- Capital Structure
- Costs of Capital

CAPITAL STRUCTURE

- NO TAXES
- TAXES
- BANKRUPTCY & OTHER COSTS
- TRADE-OFF THEORY
- PECKING ORDER HYPOTHESIS
- OTHER CONSIDERATIONS

COMPONENT COSTS

- DEBT
- PREFERRED
- EQUITY
 - DISCOUNTED DIVIDENDS
 - CAPM
- WACC Again

Optimal Capital Structure

- Goal: Maximize Value of Firm
- See Lecture Note on Value of Firm
 - $V = CF/R$ (In General)
 - We Can Max. Numerator or Min. Denominator
- Optimal Capital Structure - that mix of debt and equity which maximizes the value of the firm or minimizes the cost of capital

Investors' Required v. Cost of Capital

- Investors: $R = r + \pi + RP$
 - 1st two same for most securities
 - $RP \Rightarrow$ Risk Premium
- Security's required return depends on risk of the security's cash flows
- Cost of Capital \Rightarrow depends on risk of firm's cash flows

FIRM RISK V. SECURITY RISK

- FIRM RISK => CIRCLE CF'S
- SECURITY RISK => RECTANGLE CF'S

- ALL EQUITY FIRM: SECURITY RISK = FIRM RISK
- $R_a = R_e = WACC$
- DEBT => EQUITY RISKIER (WHY?)

COST OF CAPITAL, intro.

- **Cost of Capital is weighted average of cost of debt and the cost of equity (Why?)**
- **CAPITAL IS FUNGIBLE**
 - **GRAIN EXAMPLE**
 - **BATHTUB EXAMPLE**
- **$WACC = R_e * [E / (D + E)] + R_d(1 - t) [D / (D + E)]$**

Business Risk

- **Sales/ Input Price Variability**
- **High operating leverage**
- **Technology**
- **Regulation**
- **Management depth/breadth**
- **Competition**

FINANCIAL RISK

- The additional risk imposed on S/H from the use of debt financing.
 - Debt has a prior claim
 - S/H must stand in line behind B/H
- Higher Risk ==> Higher Required Return

TAXES

- Interest is deductible for tax purposes
- Investors still require R_d
- After-tax cost to firm: $= R_d * (1 - T_c)$
- CF's higher by amount of tax savings

Why Not Use All Debt?

- Other Tax Shields
- COSTS OF FINANCIAL DISTRESS
- DIRECT BANKRUPTCY COSTS

Accountants

Attorneys

Others

Who Pays?

Costs of Financial Distress

- **INDIRECT COSTS:**

DISRUPTION IN MANAGEMENT

Is B/R Management Specialty?

EMPLOYEE COSTS

Morale Low

Turnover increases

TRADE-OFF THEORY

- **TRADE OFF TAX ADVANTAGE OF DEBT AGAINST COSTS OF FINANCIAL DISTRESS**
- **PRACTICE:** It is impossible to solve for precisely optimal capital structure
- **FLAT BOTTOM BOAT** - None and too much important; between doesn't matter

Market Reaction to Security Issue Announcements

- Announcement of new Equity Issue

Negative reaction

- ▮ 30% of new equity issue
 - ▮ 3% of existing equity
- Announcement of new Debt Issue

Little or no reaction

- Share repurchase ==> Positive reaction

Pecking Order Summary

- Firms use **INTERNAL FUNDS** first
 - Conservative dividend policy
- If external funds, then **DEBT FIRST** (signaling problem)
- When debt capacity is used, then **EQUITY**
- Resulting capital structure is function of firm's profitability relative to invest. needs

COST OF CAPITAL

- DISCOUNT RATE DEPENDS ON RISK OF CASH FLOW STREAM
- The Cost of Capital Depends on the USE of the money, not its SOURCE
- When is WACC appropriate?
 - 📄 Project has same risk as Firm

COST OF CAPITAL

- **EXAMPLE:** Project A has IRR of 13% and is financed with 8% debt; Project B has IRR of 15% & financed with 16% equity. WACC is 12%. Which should you do?
- **Both! \implies Why?**
- **Both have $IRR > \text{Cost of Capital}$**

Debt, Bond Ratings

- STANDARD & POORS

AAA => Highest rating

BBB => adequate capacity to repay P&I

BB => Speculative (below investment grade)

Junk

CCC, D (D = default)

PREFERRED STOCK

- Preferred is like a 'perpetuity'
- $P_p = D / R_p$

$$\implies R_p = D / P_p$$

Cost of preferred = Dividend Yield

COMMON STOCK

- Three Methods

- ☰ Capital Asset Pricing Model (CAPM)

- ☰ Dividend Discount Model

- ☰ Risk Premium Method

Capital Asset Pricing Model

- 2 TYPES OF RISK:

- ☞ SYSTEMATIC (Market-wide; GDP)

- ☞ NONSYSTEMATIC (Firm specific)

- Diversification \Rightarrow can virtually eliminate nonsystematic risk

Common Stock, CAPM

- Investors should only be rewarded for systematic risk, which is measured by Beta
- Beta => a measure of the volatility of the stock relative to the market

$$R_i = R_f + B \cdot (R_m - R_f)$$

Where: R_f = risk-free rate

R_m = market return

$R_m - R_f$ = market 'risk premium'

BETA

- Beta of Market = 1
- Portfolio Beta = weighted average of all betas in the portfolio
- Where do we get Beta?
 - 📄 Regression analysis
 - 📄 Beta of firm if publicly traded
 - 📄 Beta from portfolio of 'similar' firms
 - 📄 Similar need not include financial risk

Levered/Unlevered Beta

- We can adjust Beta for Leverage as follows:

$$B_l = B_u * [1 + D/E*(1-t)]$$

and:

$$B_u = B_l / [1 + D/E*(1 - t)]$$

Levered/Unlevered Beta

- ☐ Take Levered Beta from sample portfolio
- ☐ Unlever to find 'unlevered' or asset beta, using D/E of sample portfolio
- ☐ 'Relever' unlevered beta using D/E of firm

Note: This is same process used to adjust R_e to reflect additional financial risk.

Cost of Equity: Discount Dividends

- Recall: $P_0 = D_1 / (R - g)$
- Expected returns = required in equilibrium
- We can solve above for 'expected' return:

$$R = D_1/P_0 + g$$

The trick is to estimate g (Forecasts; history; SGR)

Dividend Discount - New equity

- If new equity is issued, there are transaction costs.
- Not all proceeds go to firm.
- Let $c = \%$ of proceeds as transaction costs

Then:
$$R = D_1 / [P_0 * (1-c)] + g$$

Equity Cost: Risk Premium Method

- Add risk premium to company's marginal cost of debt
- $R_e = R_d + \text{Risk Premium}$
- Problem: Where do you get risk premium

WACC SUMMARY

- WACC =

$$R_e * [E / (D + E)] + R_d * (1 - t) [D / (D + E)]$$

Required return depends on firm risk.

Capital budgeting: Assumes project has same risk as firm.

Types of Mergers

- Horizontal Mergers
 - between competing companies
- Vertical Mergers
 - Between buyer-seller relationship companies
- Conglomerate Mergers
 - Neither competitors nor buyer-seller relationship

Motives and Determinants of Mergers

- Synergy Effect

$$NAV = V_{ab} - (V_a + V_b) - P - E$$

Where V_{ab} = combined value of the 2 firms

V_b = market value of the shares of firm B.

V_a = A's measure of its own value

P = premium paid for B

E = expenses of the operation

- Operating Synergy
- Financial Synergy
- Diversification
- Economic Motives
- Horizontal Integration
- Vertical Integration
- Tax Motives

FIRM VALUATION IN MERGERS AND ACQUISITIONS

- Equity Valuation Models

- Balance Sheet Valuation Models

- Book Value: the net worth of a company as shown on the balance sheet.
- Liquidation Value: the value that would be derived if the firm's assets were liquidated.
- Replacement Cost: the replacement cost of its assets less its liabilities.

FIRM VALUATION IN MERGERS AND ACQUISITIONS-2

- Dividend Discount Models

$$V_0 = \frac{D_1}{1+k} + \frac{D_2}{(1+k)^2} + \frac{D_3}{(1+k)^3} + \dots$$

Where V_0 = value of the firm

D_i = dividend in year I

k = discount rate

FIRM VALUATION IN MERGERS AND ACQUISITIONS-4

- Price-Earnings Ratio

$$\frac{P_0}{E_1} = \frac{1}{k} \left[1 + \frac{PVGO}{E/k} \right]$$

where PVGO = Present Value of Growth Opportunity

$$\frac{P_0}{E_1} = \frac{E_1(1-b)}{k - ROE \cdot b}$$

Implying P/E ratio

$$\frac{P_0}{E_1} = \frac{1-b}{k - ROE \cdot b}$$

where ROE = Return On Equity

FIRM VALUATION IN MERGERS AND ACQUISITIONS-5

- **Cash Flow Valuation Models**

- **The Entity DCF Model** : The entity DCF model values the value of a company as the value of a company's operations less the value of debt and other investor claims, such as preferred stock, that are superior to common equity
- . **Value of Operations:** The value of operations equals the discounted value of expected future free cash flow.

$$\text{Continuing Value} = \frac{\text{Net Operating Profit - Adjusted Taxes}}{\text{WACC}}$$

. Value of Debt

. Value of Equity

FIRM VALUATION IN MERGERS AND ACQUISITIONS-7

- **The Economic Profit Model:** The value of a company equals the amount of capital invested plus a premium equal to the present value of the value created each year going forward.

$$\textit{Economic Profit} = \textit{Invested Capital} \times (\textit{ROIC} - \textit{WACC})$$

where ROIC = Return on Invested Capital

WACC = Weighted Average Cost of Capital

$$\textit{Economic Profit} = \textit{NOPLAT} - (\textit{Invested Capital} \times \textit{WACC})$$

where NOPLAT = Net Operating Profit Less Adjusted Taxes

$$\text{Value} = \text{Invested Capital} + \text{Present Value of Projected Economic Profit}$$

STEPS IN VALUATION

- **Analyzing Historical Performance**

$$\text{Return on Investment Capital} = \frac{\text{NOPLAT}}{\text{Invested Capital}}$$

$$\text{Economic Profit} = \text{NOPLAT} - (\text{Invested Capital} \times \text{WACC})$$

$$\text{FCF} = \text{Gross Cash Flow} - \text{Gross Investments}$$

STEPS IN VALUATION-2

- Forecast Performance
 - Evaluate the company's strategic position, company's competitive advantages and disadvantages in the industry. This will help to understand the growth potential and ability to earn returns over WACC.
 - Develop performance scenarios for the company and the industry and critical events that are likely to impact the performance.
 - Forecast income statement and balance sheet line items based on the scenarios.
 - Check the forecast for reasonableness.

STEPS IN VALUATION-3

- Estimating The Cost Of Capital

$$WACC = k_b(1 - T_c) \frac{B}{V} + k_p \frac{P}{V} + k_s \frac{S}{V}$$

where

k_b = the pretax market expected yield to maturity on non-callable, non convertible debt

T_c = the marginal tax rate for the entity being valued

B = the market value of interest-bearing debt

k_p = the after-tax cost of capital for preferred stock

P = market value of the preferred stock

k_s = the market determined opportunity cost of equity capital

S = the market value of equity

- Develop Target Market Value Weights
- Estimate The Cost of Non-equity Financing
- Estimate The Cost Of Equity Financing

STEPS IN VALUATION-5

- The Arbitrage Pricing Model (APM)

$$k_s = r_f + [E(F_1) - r_f] \beta_1 + [E(F_2) - r_f] \beta_2 + \dots$$

where $E(F_k)$ = the expected rate of return on a portfolio that mimics the k^{th} factor and is independent of all others.

Beta k = the sensitivity of the stock return to the k^{th} factor.

Equity Valuation: Art & Science

Although there are valuations that are technically “wrong” (the science part of the exercise), two people can come up with five (or more!) valuations, all of which are technically “right” (the art part of the exercise).

Common valuation approaches include the following:

- Relative Valuation
 - Comparable Multiples (P/E, EV/EBITDA, P/S)
 - Comparable Transactions (esp. for M&A and buyouts)
- Sum-of-the-Parts Valuation
 - Liquidation valuation
 - Asset-based valuation
- Discounted Cash Flow (DCF) Valuation
 - Free Cash Flow to Firm (FCFF) and Free Cash Flow to Equity (FCFE)
 - Dividend Discount Model (DDM)
 - Economic Profit Models: Residual Income (RIM), Residual Operating Income (ReOI), Economic Value Added (EVA), Economic Profit Model

Why the DCF Model?

Although relative valuation is frequently used by sell-side analysts, DCF models form the backbone of equity valuation—in fact, every multiple is composed of assumptions used in DCF valuations. We will focus on various DCF models in this session.

Never forget this fact: DCF models rely on pro forma financial forecasts. As long as forecasts and discount rate assumptions are *consistent*, the various DCF models (FCFF, FCFE, RIM, and ReOI, Economic Profit or EVA) will deliver the *exact same* valuations.

For example, you will often hear people comparing FCFF (Enterprise DCF) and Economic Profit models and claiming one provides better value estimates than the other. The truth is that both models rely on the same pro forma forecasts and if the model is calibrated properly, they will deliver the same results. That said, there is an argument that the Economic Profit approach provides better insight into “value creation” whereas FCF is a “liquidation” concept.

Differences and discrepancies usually arise from improper specification of terminal and/or continuing values. In fact, you will occasionally see professors make these mistakes—don’t let it slide! This is a tricky area where many mistakes are made all the time.

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First, Value the Firm

We advocate the Enterprise DCF model and the Economic Profit model. Again, both will provide the same valuation—which you choose depends on which improves your understanding of how value is created. For special situations, the APV model may be more helpful, but we will not have time to discuss the model today.

Enterprise models are important because they:

- Help direct our attention to the drivers of value creation;
- Enable us to identify and disentangle investment and financing sources of value for equity holders; and
- Are consistent with capital budgeting processes used in most companies.

In the Enterprise DCF Model, the value of operations is the discounted value of expected free cash flows available to all of the company's capital providers.

In the Economic Profit Model, the value of the company equals the amount of capital invested plus the present value of expected economic profit each year.

So what is free cash flow? What is economic profit?

Economic Profit Model

In the forecast years:

- Economic Profit = Beginning Invested Capital x (ROIC – Cost of Capital)
- Economic Profit = NOPLAT – Capital Charge
- Economic Profit = NOPLAT – (Invested Capital x Cost of Capital)

Continuing Value Calculation:

- Continuing Value = $(\text{Economic Profit}_{T+1} / \text{Cost of Capital}) + \{(\text{NOPLAT}_{T+1})(g_{T+1} / \text{ROIC}_i)(\text{ROIC}_i - \text{Cost of Capital})\} / \{\text{Cost of Capital} \times (\text{Cost of Capital} - g_{T+1})\}$

Where:

Economic Profit_{T+1} = Normalized economic profit in the first year *after* explicit forecast period.

NOPLAT_{T+1} = Normalized level of NOPLAT in first year *after* explicit forecast period.

g_{T+1} = Growth rate in NOPLAT in perpetuity.

ROIC_i = expected return on *incremental* invested capital (net new investment)

Equity Value = Beg. Invested Capital + PV of Forecast Economic Profit + PV of Continuing Value – Net Financial Obligations (NFO)

Common Pitfalls

The most common error is “naïve base-year extrapolation”. In the DCF model, it is rarely the case that the continuing value base year FCF estimate is equal to the final forecast year multiplied by 1 plus the long-term growth rate!

Generally, the rate of sales and NOPLAT growth is higher in the forecast period than over the long-term. If we transition from a period of high growth to slow growth but assume FCF in the transition year grows at the long-term rate then we are implicitly assuming the same reinvestment rate of NOPLAT even though growth has slowed.

This can significantly understate firm value, as generally we assume that for a given expected ROIC, slower growth will require a lower reinvestment rate.

By the same token, if we assume growth slows but the reinvestment rate stays the same, then we are effectively forecasting lower marginal ROIC. We have to ask if this is what we intend to forecast—the goal is to make sure the pro forma forecasts make sense according to our expectations regarding ROIC and long-term growth.

Common Pitfalls

Another pitfall is over-conservatism in the continuing value calculation.

Using the value-driver model, it is common for analysts to assume that incremental ROIC equals the Cost of Capital. If this is the case, then additional growth does not add value to the firm—now you don't have to forecast a growth rate!

Sounds nice, but consider Microsoft or Coca-Cola or Procter & Gamble...does it make sense to make a 5-10 year forecast for these companies and then assume that all incremental investment is value-neutral? I doubt it and you should too.

Again, the goal should be to think clearly about the economic future you want to forecast and make sure your pro forma estimates reflect your assumptions about long-term value creation.