



Financial Principles for Accountants

FPA2



Financial Principles for Accountants

- Course Objectives
 - Appreciate the critical relationship between accounting, auditing, and finance
 - Describe the concepts of risk, standard deviation, diversification, and beta.
 - Calculate cost of debt, cost of equity, and weighted average cost of capital
 - Explain growth project selection criterion



Financial Principles for Accountants

- Introduction – Accounting, Auditing, and Finance
- Topic 1 – Sources of Funds
- Topic 2 – Cost of Funds
- Topic 3 – Best Use of Funds
- Final Contemplations - Two Rules of Finance

Unit 1

Accountants and Finance



Financial Principles for Accountants

- What is accounting and auditing?
- What is finance and the finance role?



Accounting and Auditing Role

- Recording and analyzing the financial transactions of a business
 - Posting – journals/ledgers
 - Summarizing – trial balances/financial statements
 - Analyzing and auditing
 - Reporting – financial statement/tax returns
 - Communicating financial information



Role of Finance

- Process of securing money (aka funding or capital) and using money efficiently in a business
 - Obtaining funding at the lowest cost
 - Employing capital to obtain the best possible rate of return
 - Monitoring and measuring success



Financial Principles for Accountants

- Accounting, auditing, and finance are critical for both private and public companies
- Public company accounting and auditing are regulated and subject to government oversight, including:
 - GAAP
 - SEC
 - PCAOB
 - State Accountancy Boards



Financial Principles for Finance

- In the same way, finance activities are subject to oversight for public companies, including:
 - SEC
 - Financial Stability Oversight Council (FSOC)
 - The Federal Reserve Board (The Fed)



Why the Strict Regulation

- Laws enforced by the SEC and standards like GAAP protect investors, and the financial system itself
 - Investors are those who provide funds to businesses
 - Stock purchasers/owners
 - Credit providers
 - Regulations require consistency and accuracy



Users of Accounting Information

- Investors
- Oversight agencies
- Regulators
- Tax authorities
- Customers, suppliers, public
- **Management/finance functions**



Accountant and Auditor Role in Finance Management

- Accounting data is critical to financial management
- Recording - accuracy
 - Role of information technology (IT)
- Auditing - verify and certify accuracy
- Tax - tax returns start with the income statement
- Finance is only as good as the data

Unit 2

Sources of Funds



Sources of Funds

- Where does a business acquire money (aka funds, capital)?
- Is there a “best” source of capital?

Sources of Capital

- Sell stock (owner investment)
- Borrow (debt)
- Profits
- Sell assets
- Other sources?

Balance Sheet

A typical balance sheet:

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

Acme Incorporated Balance Sheet December 31, 20XX				
Assets			Liabilities	
Current Assets			Current Liabilities	
Accounts Receivable	33,000		Accounts Payable	32,000
Prepaid Rent	2,000		Taxes Payable	2,000
Inventory	40,000		Wages Payable	500
Short-term Investments	2,000		Accrued expenses	1,000
			Short-term Debt	1,000
Total Current Assets	77,000		Total Current Liabilities	36,500
Long-term Assets			Long-term Liabilities	
Land	5,000			
Buildings	20,000		Bank Debt	20,000
Accumulated Depreciation	5,000	15,000	Bonds	10,000
Equipment	15,000		Deferred Taxes	1,000
Accumulated Depreciation	3,000	12,000	Post-retirement benefits	5,000
Intangible Assets		2,000		
			Total Long-term Liabilities	36,000
Total Long-term Assets	34,000		Total Liabilities	72,500
			Owners' Equity	
			Common Stock	15,000
			Retained Earnings	23,500
			Total Owners' Equity	38,500
Total Assets	111,000		Total Liabilities & Owners' Equity	111,000

Balance Sheet from a Finance Perspective

From a finance
view:
Sources of funds =
Uses of funds

Acme Incorporated Balance Sheet December 31, 20XX			
Use of Funds		Sources of Funds	
Assets		Liabilities	
Current Assets		Current Liabilities	
Accounts Receivable	33,000	Accounts Payable	32,000
Prepaid Rent	2,000	Taxes Payable	2,000
Inventory	40,000	Wages Payable	500
Short-term Investments	2,000	Accrued expenses	1,000
		Short-term Debt	1,000
Total Current Assets	77,000	Total Current Liabilities	36,500
Long-term Assets		Long-term Liabilities	
Land	5,000		
Buildings	20,000	Bank Debt	20,000
Accumulated Depreciation	5,000 15,000	Bonds	10,000
Equipment	15,000	Deferred Taxes	1,000
Accumulated Depreciation	3,000 12,000	Post-retirement benefits	5,000
Intangible Assets	2,000		
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		Common Stock	15,000
		Retained Earnings	23,500
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Total Assets	111,000	Total Liabilities & Owners' Equity	111,000

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Balance Sheet from a Finance Perspective

- Every dollar under liabilities and owners' equity is "invested" in the business
- Every dollar under assets shows where those dollars are invested
- A company cannot invest dollars until it has them from some source – therefore must be equal (the sources of capital must equal the use of the capital)

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Balance Sheet from a Finance Perspective

- Current liabilities:
 - “Spontaneous” liabilities (e.g., payables) – arise in operations
 - Most have “0” cost!

Current Liabilities	
Accounts Payable	32,000
Taxes Payable	2,000
Wages Payable	500
Accrued expenses	1,000
Short-term Debt	1,000
Total Current Liabilities	36,500

Balance Sheet from a Finance Perspective

- Current liabilities - advantages:
 - Current liabilities are a great source of funds
 - Lowest cost funds (or no cost)
 - Somebody else “pays” the cost of the money
 - Relatively easy to manipulate and manage

Balance Sheet from a Finance Perspective

- Current liabilities - disadvantages:
 - Current liabilities can cause cash flow problems
 - Must be paid within short time frame
 - Critical to pay or business operations stop
 - Careful management to assure short-term assets turn to cash as quickly as current liabilities become due

Balance Sheet from a Finance Perspective

- Long-term Liabilities
 - Stable and traditional source of growth and operating funds

Long-term Liabilities	
Bank Debt	20,000
Bonds	10,000
Deferred Taxes	1,000
Post-retirement benefits	5,000
Total Long-term Liabilities	36,000



Balance Sheet from a Finance Perspective

- Long-term liabilities - advantages:
 - Planned long-range repayment
 - Sources of large amounts of capital
 - Often continuous with renewal at end of term
 - Long-term debt is an interest cost, not a principal repayment cost
 - Lower cost capital compared to equity



Balance Sheet from a Finance Perspective

- Long-term liabilities – disadvantages:
 - Requires good credit rating
 - “Conditions” and perhaps collateral
 - May not be renewable at same interest cost
 - In economic downturn, interest payment difficult
 - Lenders control destiny

Balance Sheet from a Finance Perspective

- “Owners” equity
 - Owners’ investment in the business
 - Permanent financing

Owners' Equity	
Common Stock	15,000
Retained Earnings	23,500
Total Owners' Equity	38,500
Total Liabilities & Owners' Equity	111,000

Balance Sheet from a Finance Perspective

- Owners’ equity - advantages:
 - No repayment
 - No required “interest payments” to owners
 - Retained earnings are reliable source of growth funds for a profitable and growing company



Balance Sheet from a Finance Perspective

- Owners' equity - disadvantages:
 - High cost
 - Issuing new stock highly regulated and expensive
 - Growth of retained earnings dependent on economy – not in control of company



Capital Structure – Sources of Capital

- Determining amount of funds from each source
- Traditional rule:
 - Current liabilities fund current assets
 - Long-term debt and equity fund long-term assets



Capital Structure – Sources of Capital

- Better sourcing decisions consider other factors:
 - Operating and financial leverage
 - Cash flow ability to service debt
 - Ability to use tax benefits
 - Credit rating and debt availability
 - Best overall cost of funds



Operating Leverage

- Degree of increase in operating income from increased revenue (sales)
- High operating leverage associated with high fixed assets
- Higher sales produce greater increase in operating income because most costs are fixed
- Higher revenue does not substantially increase costs



Operating Leverage

- Operating leverage example:
 - \$1 million fixed costs (operation of plant/equipment)
 - Sale price of product is \$150 per unit
 - Sales 10,000 units per year
 - Fixed costs/unit = \$100 per unit ($\$1,000,000 / 10,000$)
 - Variable costs = \$25 per unit
 - Profit on 10,000 units = \$250,000
 - Profit per unit = \$25

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Operating Leverage

- Operating leverage example (continued):
 - Breakeven
 - Sales = total fixed costs / sales price per unit – variable costs per unit
 - = $\$1,000,000 / \$150 - 25$
 - = 8,000 units
 - Lose 2,001 units of sales = loss

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Operating Leverage

- Operating leverage example (continued):
 - Sales increase to 12,000 units per year
 - Sale price is \$150 per unit
 - Total fixed costs = \$83.33 per unit
 - Variable costs = \$25 per unit
 - Profit on 12,000 units = \$500,000
 - Profit per unit = \$41.67



Operating Leverage

- Operating leverage example (continued):
 - Increase in sales by 2,000 units doubles profits
 - 20% increase in sales = 100% increase in profits
 - Decrease in sales by 2,000 units causes loss
 - 20% decrease in sales = 100% decrease in profits
 - High degree of operating leverage = high risk from economic or market changes



Operating Leverage

- High degree of operating leverage means higher business risk
 - If economy or company falter, still must meet high fixed costs
- High risk generally results in higher cost of capital



Financial leverage

- Measures increase in income as debt increases
 - Positive if return on assets exceeds cost of debt [$ROA > \text{cost of debt (interest rate)}$] to buy them
- Also, measures increase in ROE as ROA increases
 - Positive if ROE increases as debt increases



Financial Leverage

- Financial leverage example:
 - Company borrows \$1 million to purchase new equipment
 - New equipment produces \$150,000 additional profit per year
 - $\text{ROA} = \$150,000 / \$1,000,000 = 15\%$
 - Cost of debt = 5% interest
 - ROA exceeds cost of debt $15\% > 5\%$
 - Earned \$150,000 with cost of only \$50,000

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Financial Leverage

- Financial leverage example (continued):
 - Prior year profit \$1,000,000
 - Prior year owners' equity \$10,000,000
 - Prior year ROE = $\$1,000,000 / \$10,000,000 = 10\%$
 - Current year profit \$1,150,000
 - Current year owners' equity \$10,150,000
 - Current year ROE = $\$1,150,000 / \$11,150,000 = 10.3\%$
 - Company increased profits and ROE without any investment of owners' funds

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Financial Leverage

- High financial leverage has risks:
 - High debt requires cash flow to pay interest
 - Higher amounts of debt require higher interest rates
 - Changes in economic conditions or company sales may cause inability to pay debt interest



Financial Leverage and Operating Leverage

- High fixed asset business has higher risk
- High debt financed business has higher risk
- Imprudent to combine both high fixed assets with high debt as this increases total risk
- High fixed asset business typically should carry less debt relative to equity



Capital Structure Summary

- Use spontaneous and often “free” short-term liabilities to extent cash flows allow
- Choose long-term debt versus equity (to a point)
 - Consider risks (financial and operating leverage)
 - Consider relative costs

Unit 3

Cost of Funds



Cost of Funds

- Does all business capital have a cost?
- What is the “cost” of funds?
- Does equity capital have a cost?
- What is the goal of financial management relative to capital costs?



Cost of Funds

- A substantial amount of corporate capital does not have a “cost”
- Cost refers to the rate of return that must be paid to the provider of the funds
- Equity has a high cost
- Financial management wants to minimize the overall cost of capital in the business



“Free” Capital

- As previously discussed, non-debt short term liabilities are essentially no cost sources of capital – examples:
 - Accounts payable
 - Accrued taxes
 - Accrued expenses
 - Accrued wages



“Free” Capital

- May not be truly free:
 - Somebody else pays the cost, for example:
 - Suppliers
 - Employees
 - Governments (society)
 - Sometimes involves relationship costs (e.g., suppliers)



“Free” Capital

- Increasing “free” capital:
 - Negotiate longer payment terms
 - Do not pay until due date
 - Pay wages less often
 - Pay taxes on last day without penalty
 - Pay expenses in arrears instead of in advance (e.g., rent)



“Free” Capital

Example – increasing “free” capital :

Labor union wanted better medical insurance for workers

Employer could not afford the cost

Settlement - employer provided better medical insurance; employees were paid monthly instead of weekly

Delay paying wages substantially increased free capital decreasing borrowing costs - and cut payroll processing costs



“Free” Capital

- Example – increasing “free” capital (continued):

Applying numbers to the example:

Savings for payroll change amounted to about \$60 per employee per month
- \$720 per year

This was more than enough to add prescription drug coverage

About 70% of employer savings was time value of money earned on the delayed wages!



Cost of Funds

- “Cost” refers to rate of return paid for capital
- For debt, it refers to interest rate
- For equity, it refers to rate of return expected by owners (e.g., shareholders)



Cost of Funds

- Money for expansion is typically not free:
 - Although “free” capital arising from working capital may be adequate to fund additional working capital
 - People with money want to put it to use to earn a return
 - People who need money are willing to pay to use it
 - Financial markets and financial intermediaries move funds from those who have it to those who want to use it



Financial Intermediaries

- Move money from savers to users:
 - Banks, credit unions, et.al.
 - Pension and retirement funds
 - Insurance companies
 - Hedge funds
 - Mutual funds
 - Stock markets, mortgage brokers, investment bankers



Cost of Debt

- Relatively simple to compute – interest rate of the loan
- But tax shield must be considered
- Top corporate rate is now 21%, so cost of debt is now 79% of the stated interest rate because interest is deductible from taxable income



Cost of Debt

- Cost of debt example:
 - Loan interest rate is 6%
 - Company borrows \$1,000,000
 - Interest is \$60,000 per year = cost of debt
 - Interest is deductible on tax return
 - If income is \$2,000,000, taxable income is reduced to \$1,940,000 with new interest



Cost of Debt

- Cost of debt example (continued):
 - Tax on \$2,000,000 = \$420,000
 - Tax on \$1,940,000 = \$407,400
 - Tax savings (aka tax shield) = \$12,600
 - Real cost of debt is $\$60,000 - \$12,600 = \$47,400$
 - As percentage, cost of debt = $\$47,400 / \$1,000,000 = 4.74\%$ or 79% of 6% loan rate



Cost of Debt

- Tax shield is further increased by state income taxes
- Result is cost of debt being substantially lower than stated interest rate
- BUT, must also consider cost of debt conditions or limitations



Cost of Debt

- Debt covenants and limitations:
 - Cost of debt may be increased by non-interest costs:
 - Demand account minimum balance requirements
 - Required services or fees (e.g., payroll account)
 - Collateralization of receivables
 - Debt restrictions or debt/equity ratio limits
 - Budget submission and monitoring



Cost of Equity

- Caveat: Owners of a business expect a rate of return on the money they invest in the business
- Rate of return expected by owners is more difficult to compute
- It is not a stated number like loan interest
- As for many elements of finance, estimates used (aka “educated guess”)



Cost of Equity

- Three primary methods of estimating return on equity
 - Dividend growth model
 - Price earnings model
 - Capital asset pricing model (CAPM)



Cost of Equity

- Dividend growth model
 - Uses dividend return and expected growth formula
 - Cost of equity = (Next dividend/price of stock) X dividend growth rate



Cost of Equity

- Dividend growth model (example):
 - IBM current dividend \$6.60/year
 - IBM current stock price \$173
 - Dividend growth rate (3-year) .61%
 - Cost of equity = $[(\$6.60 \times 1.0061/173)] + .61\% = 4.4\%$
 - IBM distributes about 88% of its earnings per share
 - Share value increased 13% over last three years (4.3% per year)
 - Assuming all else is neutral, what return is our investor getting? What is the cost of capital?



Cost of Equity

- Price earning model:
 - Relatively easy formula
 - Divide 1 by the price/earnings ratio
 - If p/e is 20, the expected rate of return by owners is 5%



Cost of Equity

- Price earning model (continued):
 - In today's low interest markets, many companies have p/e ratios between 18 – 30.
 - The S&P 500 market average is about 23 (4.3%)
 - Stocks are priced high reflecting lack of other investment opportunities



Cost of Equity

- Price earning model (continued):
 - High stock prices suggest that owners are receiving (and expecting) much higher rates of return than the 4.3% (1 / 23) indicated by the p/e model
 - For example, S&P 500 stock prices increased by 8% per year over the past three years
 - More accurate reflection of shareholders' expectations?
 - Stock value typically reflects what investors expect in the future, based on what happened in the past



Cost of Equity

- Price earning model example:
 - IBM
 - p/e ratio = 18
 - P/e model rate of return = $1/18$ or 5.6%
 - IBM stock has increased in price over last three years by about 4.3% per year



Cost of Equity

- CAPM
 - This model uses a multi-factor approach that considers risk free rates of return and adds market and individual company risk factors
 - Cost of equity = risk free rate + [beta X (market rate – risk free rate)]
 - Beta is a measure of company risk that is computed using variance. Beta for all traded companies can be found on the internet – e.g., <https://finance.yahoo.com>



Cost of Equity

- CAPM (continued)
 - *Beta* measures the variation in change of an individual stock compared to all market stocks. It is represented as a number - with “1.0” equal to the market volatility
 - *Beta* of 1.0 indicates that stock price moves with the market. Market risk reflects general economic conditions not related to the risk of the individual company. *Beta* of 1.0 has market risk only; no separate company risk



Cost of Equity

- CAPM (continued)
 - A *beta* less than 1.0 means that the stock is less variable than the market. The stock has less risk than the market. Typically found in stable industries like utilities
 - A *beta* more than 1.0 means that the stock is more variable than the market. Stock has company risk in addition to market risk



Cost of Equity

- CAPM (continued)
 - Negative *beta* implies that the stock moves opposite the market. If the market decreases, a negative beta stock should increase. Example may be gold stocks
 - *Beta* attempts to integrate an individual firm's risk in the computation of return on equity.
 - Market risk is built into the formula using market rate of return (e.g., the S&P 500 historic rate of return)



Cost of Equity

- CAPM (continued)
 - If an individual firm is not publicly traded (and its *beta* cannot be determined), the formula will use an industry or related company *beta* to estimate the company's *beta*
 - Note that *beta* is somewhat theoretical. In practice, *beta* is not a great predictor of stock movement



Cost of Equity

- CAPM (continued)
 - The risk-free rate of return used in CAPM is the interest rate of a 10-year Treasury bond
 - Treasury bonds are considered risk free because they are backed by the government. While there is some risk of government failure, it is considered unlikely

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Cost of Equity

- CAPM example:
 - IBM beta is .76
 - 10-year Treasury bond rate is 4.14%
 - Market rate of return is S&P 500 (45-year average) = 10.26%
 - Cost of equity = risk free rate + [beta X (market rate – risk free rate)]
 - = $4.14 + [.76 (10.26 - 4.14)] = \mathbf{8.8\%}$

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Cost of Equity

- CAPM example (continued):
 - IBM CAPM rate is 8.8%
 - Compare to p/e model rate of 5.6%
 - Compare to dividend growth rate model of 4.4% (or 8.7%)
 - Compare to gurufocus (<https://www.gurufocus.com>) that computes IBM cost of equity to be 7.2%
 - Compare to value investing (<https://valueinvesting.io>) that computes IBM cost of equity at 9.3%



Cost of Equity

- Equity expected rate of return summary:
 - Three models: CAPM, inverted p/e ratio and market appreciation, dividend growth
 - Should dividend model consider market appreciation?
 - P/E ratio method reflects earnings, but not risk or appreciation
 - CAPM uses beta that has proved unreliable
 - Dividend growth not available if no dividends paid; questionable results when earnings not distributed



Cost of Equity

- Observations about costs of capital:
 - “Free” capital is not considered in determining company cost of capital – it is typically not used to fund growth
 - Cost of debt normally less than equity
 - Debt has less risk – paid before shareholders
 - Debt rate is reduced by tax shield
 - Company cannot use only debt as financing



Cost of Equity

- Observations about costs of capital (continued):
 - As use of debt increases, its cost increases
 - At some point debt will not be available; lenders will not take risk of owners
 - Debt and equity mix will differ depending on risks of the business
 - Debt rate and equity rates are two separate components of company cost of capital



Weighted Average Cost of Capital (WACC)

- Cost of debt and cost of equity must be married to determine a company's average cost of funds
- Formula is a simple weighted average
- $\text{WACC} = \text{cost of debt} \times \text{proportion of debt to total capital} + \text{cost of equity} \times \text{proportion of equity to total capital}$
- $\text{Total capital} = \text{equity} + \text{long-term debt}$



Weighted Average Cost of Capital (WACC)

- WACC example:
 - Company cost of debt is 6%; company tax rate is 21%
 - Company cost of equity is 12%
 - Company has \$2,000,000 of long-term debt
 - Company has \$1,800,000 of equity (common stock and retained earnings)
 - Company cannot obtain greater portion of debt



Weighted Average Cost of Capital (WACC)

- WACC example:
 - Total current capital is \$3,800,000
 - Proportion of debt = $\$2,000,000 / \$3,800,000 = 52.6\%$
 - Proportion of equity = $\$1,800,000 / \$3,800,000 = 47.4\%$
 - $\text{WACC} = (.06 \times .79 \times .526) + (.12 \times .474) = .0815 = \mathbf{8.18\%}$



Financial Management Use of Cost of Capital

- Cost of capital is important relative to investment choices
- Cost of capital impacts sources and structure of funds
- Cost of capital influences whether growth in terms of new fixed assets can take place
- Cost of capital attracts investors
- Cost of capital affects dividend decisions



Financial Management Use of Cost of Capital

- Goal of financial management is to minimize WACC to lowest possible point
- Data is generally not available to accurately compute
- General rule is that as debt increases, it becomes more expensive as creditors assume more risk
- Also, cost of equity will increase as debt increases because owners face higher risk from increasing debt

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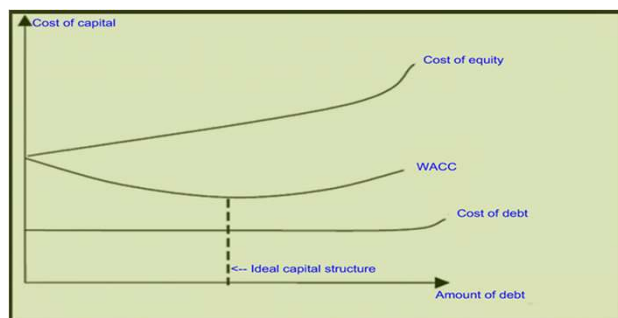
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Financial Management Use of Cost of Capital

- Financial management use of cost of capital (continued):
 - Ideal level of debt is where combination of debt and equity cause lowest WACC
 - Can be charted as shown:



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Topic 3

Best Use of Funds



Uses of Capital (Funds)

- Pay operating expenses
- Expand production
- Acquire other lines of business
 - Acquisitions
 - Internal development



Uses of Capital

- Uses of capital – considerations:
 - Availability and cost of capital
 - Rate of return anticipated on planned expenditure
 - Analysis of costs
 - Risk



Uses of Capital

- Uses of capital – considerations (continued)
 - Analysis of costs
 - Up-front and future fixed costs
 - Variable costs over time (labor, materials)
 - Working capital (accts. receivable, inventory, cash)
 - Maintenance and depreciation over time



Uses of Capital

- Uses of capital – considerations (continued):
 - Up-front costs
 - Purchase costs of fixed assets
 - Design and engineering costs
 - Permits, required studies, legal fees, and accounting fees
 - Hiring, training, and start-up costs



Risk

- Risk
 - Failure of project
 - Underperformance – lower ROI than forecast
 - Changes in market or economy
 - Product demand
 - Economic downturn



Risk

- Risk is defined as variation from expected results
 - Using historic data and market and production forecasts, an expected ROI is determined
 - Accurate records and estimates are required
 - Risk is determined by the potential variation from the anticipated rate of return
 - Risk can be computed as a function of variation



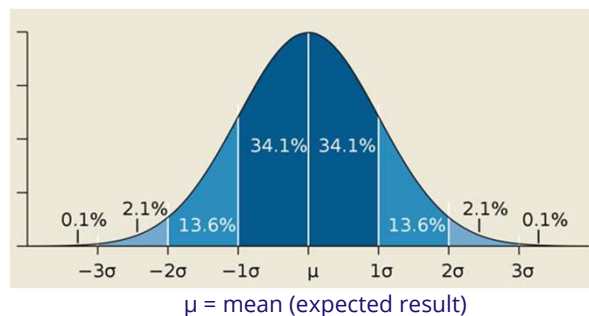
Risk

- To compute a measure of risk
 - Requires several years (preferably 5) years of data
 - Average the rates of return for each year to calculate the “expected rate of return”
 - Calculate the difference each year from the average
 - Calculate the standard deviation for the differences



Risk

- Using the “empirical rule,” the standard deviations for any normal distribution will result in the following distribution:
 - 68.2% of time variation (risk) falls within 1 standard deviation
 - 95.4% will fall within 2 standard deviations



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Risk

- Risk example:
 - Acme Inc. is planning a new plant to increase production
 - Rate of return (ROA) on current plant for last five years is:
 - Year 5 12%
 - Year 4 11%
 - Year 3 10%
 - Year 2 16%
 - Year 1 12%

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Risk

- Risk example (continued):

- Average rate of return = 12.2%
- 12.2% return is the expected rate of return on new plant

▪ Year 5	12%	difference	0.2%
▪ Year 4	11%		1.2%
▪ Year 3	10%		2.2%
▪ Year 2	16%		3.8%
▪ Year 1	12%		0.2%

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Risk

- Risk example (continued):

- Standard deviation is square root of differences squared
- In example, it is 4.6%
- That means that 68.2% of time return will be plus or minus 4.6% from 12.2%; range 7.6% to 16.8%
- 95.4% it will be between 3.0% and 21.4%
- Even with fairly close spread on rates of return, this is considerable risk because there is substantial variance

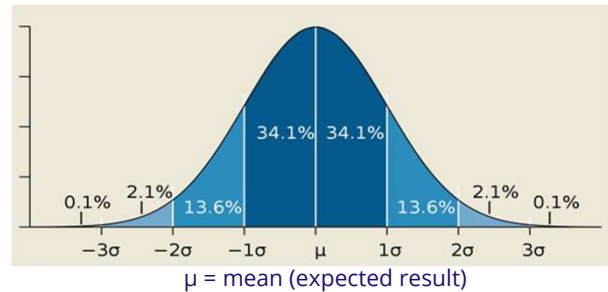
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Risk

- Risk example (continued):
 - If company WACC is 7.5%, the company has a “risk” of loss (where rate of return is less than cost of funds)
 - There is a 15.8% chance of rate of return being below 7.6%



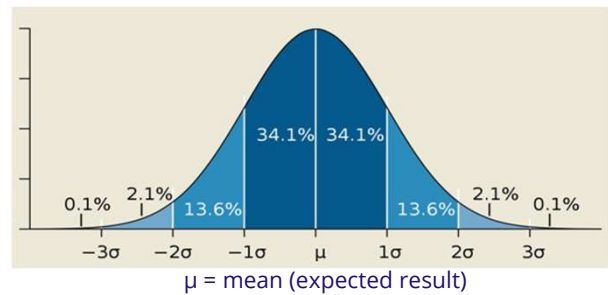
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Risk

- Risk example (continued):
 - Note that there is also a 15.8% chance rate of return will be in excess of 16.8%
 - Risk is only a function of variation – risk has a “bad” side and a “good” side that are equal



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Risk

- How does financial management evaluate risk?
 - Risk is important consideration because:
 - If “cost” of project is not met, loss occurs
 - Insufficient cash flow to pay interest on project loan
 - And, bankruptcy can result
 - Is a 15.8% chance of bankruptcy acceptable?



Risk

- How does financial management evaluate risk (continued):
 - Management must “accommodate” risk:
 - Minimize risk – avoid combined operating and financial risk, adequately capitalize, control variable costs (including variable interest rates)
 - Reserves (in form of cash or short-term securities)
 - Credit facility to meet “bad” years (e.g., line of credit)
 - Diversification – multiple projects or other investments



Selecting Growth Opportunities

- Multiple opportunities may exist:
 - New plant and equipment – expansion of current business
 - New products or services – expand to other lines of business
 - Horizontal or vertical



Selecting Growth Opportunities

- Multiple opportunities may exist:
 - Acquisition of competitor or supplier or new business
 - Shut down a current product or plant
 - Increase sales force or marketing efforts
 - Reorganize or restructure the business



Selecting Growth Opportunities

- All projects have a cost
- Cost implies that funds are needed to implement
- Costs of each potential project must be established
- Cost of funds to achieve each plan must be determined



Selecting Growth Opportunities

- Projects are only undertaken if they promise return
- Fundamental that return must be in excess of costs
- Projects can be evaluated by comparing return expected to costs – profitability of each project
- Projects are selected in order of profitability



Selecting Growth Opportunities

- Determining costs and profitability – use CASH only
 - All money estimates of costs, returns, and profits expressed as cash (present and future)
 - Cash is required to pay bills. Only cash can be distributed (and spent) by owners. Therefore, cash analysis required
 - Accrual of income and expenses does not determine cash flows



Selecting Growth Opportunities

- Determining costs and profitability – CASH only (continued)
 - Expressed as cash:
 - All first-year implementation costs
 - All future costs
 - All expected revenue from the project (or savings)
 - Added revenue or added savings = both can add profit
 - Salvage value/cleanup costs at end of project



Selecting Growth Opportunities

- Determining costs and profitability – CASH only (continued)
 - Cash means:
 - Actual cash flows (in or out)
 - No deductions for depreciation or other non-cash items
 - Revenue when received, costs when paid, not when accrued



Selecting Growth Opportunities

- Determining costs and profitability – present value
 - Once cash inflows and outflows are projected
 - First year costs and revenue tallied at face
 - Future revenue and costs “present valued”
 - Salvage value or cleanup costs “present valued”



Selecting Growth Opportunities

- Determining costs and profitability – present value
 - Present value calculated using WACC
 - WACC represents the cost of funds that must be surpassed for a project to be profitable
 - Different projects can produce rates of return less than, that meet, or that exceed WACC
 - Project preference is determined by highest return in excess of WACC



Selecting Growth Opportunities

- Net present value (NPV)
 - NPV compares positive cash flows received from a project to negative cash flows out
 - $NPV = \text{Present value of cash flows in (revenue)} - \text{present value of cash flows out (costs)}$
 - Subtracts costs of a project from its revenue
 - Positive number indicates profitable project



Selecting Growth Opportunities

- NPV example 1:
 - Acme decides to purchase new equipment for \$800,000
 - Cash flow from project estimated to be \$200,000/year
 - Future cash flow = revenue – expenses (cash basis)
 - Salvage value of equipment at end of year 7 = \$100,000
 - WACC is 10%



Selecting Growth Opportunities

- NPV example 1:

NPV = present value of \$200,000 for seven years + present value of \$100,000 after seven years – \$800,000

PV of \$200,000 – 7 years = \$973,600 +

PV of \$100,000 after 7 years = \$51,320 –

Cost \$800,000

= \$224,920



Selecting Growth Opportunities

- Net present value (NPV) Example 2:
 - Acme can also outsource its HR Department
 - Contract services cost \$150,000 per year (forever)
 - Savings from salaries is \$250,000 per year (forever)
 - Immediate shut down costs = \$150,000
 - Severance payments = \$250,000 (2 years)
 - WACC is 10%



Selecting Growth Opportunities

- Net present value (NPV) example 2:
 - $NPV = PV \text{ savings } \$250,000 - \$150,000 \text{ (forever)} - [\$150,000 + PV \$250,000 \text{ (2 years)}]$
 - PV of \$100,000 (forever) = \$1,000,000 –
 - Immediate shut down cost = \$150,000 –
 - PV of \$250,000 (2 years) = \$434,000
 - = **\$416,000**



Selecting Growth Opportunities

- Net present value (NPV) examples:
 - Projects have similar initial costs
 - New equipment - \$800,000
 - Close HR Office - \$584,000
 - HR Office closure has much higher NPV
 - Which to choose?



Selecting Growth Opportunities

- Net present value (NPV) and growth
 - Businesses do not have unlimited funds
 - Businesses cannot continue to raise funds without heavy costs and risk
 - Growth is typically managed based on available capital – retained earnings and debt primarily
 - Growth projects are carefully selected based on best profitability forecast



Selecting Growth Opportunities

- Net present value limitations:
 - Estimating revenue
 - Reliable data
 - Market changes
 - Coordination with and commitment from Marketing
 - Inflation
 - Rate of return on cash flows received



Selecting Growth Opportunities

- Net present value limitations (continued)
 - Estimating costs
 - Reliable data
 - Unknown market/supplier/labor issues/inflation
 - “Failure” costs – shut down costs if project fails
 - Repayment of debt principal – the equity residual method (NPV-ER), considers principal repayment in determining the cash flows



Selecting Growth Opportunities

- Net present value limitations (continued)
 - Cost of equity and WACC
 - At best, an educated guess
 - Rates change over time – market/economic conditions
 - Currency fluctuations (if overseas operations involved)



Selecting Growth Opportunities

- NPV in real world:
 - Simple computations replaced with computer models and simulations
 - Allows for consideration of many variations in facts
 - Allows for a more detailed analysis of finer facts (e.g., variable costs, inflation)
 - Allows for deeper evaluation of variance and risk
 - Produces range of results



Selecting Growth Opportunities

- Other project evaluations tools

- Payback period

- $\text{Cost} \div \text{cash flow per year}$
 - Acme project 1 = $\$800,000 / \$200,000 = 4.0$ years
 - Acme project 2 = $\$584,000 / \$100,000 = 5.8$ years
 - Management likes quick cost recovery – more predictable and less risk

• Net Present Value (NPV) example 1:

- Acme decides to purchase new equipment for \$800,000
- Cash flow from project estimated to be \$200,000/year
- Cash flow calculated as revenue – expenses (cash basis)
- Salvage value of equipment at end of year 7 = \$100,000
- WACC is 10%

• Net Present Value (NPV) example 2:

- Acme can also outsource its HR Department
- Contract services cost \$150,000 per year (forever)
- Savings from salaries is \$250,000 per year (forever)
- Immediate shut down costs = \$150,000
- Severance payments = \$250,000 (2 years)
- WACC is 10%



Selecting Growth Opportunities

- Internal rate of return (IRR)

- Rate where NPV = “0”
 - Rate where profit = cost
 - $\text{Cost} = \text{PV @ IRR}(\text{income stream})$
 - Gives rate of return for the project
 - Acme project 1: $\$800,000 = (\text{PV IRR}) (\$200,000 \text{ for seven years}) \approx \mathbf{16\%}$
 - Acme project 2: $\$584,000 = (\text{PV IRR})(\$100,000 \text{ forever}) \approx \mathbf{17\%}$
 - Higher IRR indicates more productive project

• Net Present Value (NPV) example 1:

- Acme decides to purchase new equipment for \$800,000
- Cash flow from project estimated to be \$200,000/year
- Cash flow calculated as revenue – expenses (cash basis)
- Salvage value of equipment at end of year 7 = \$100,000
- WACC is 10%

• Net Present Value (NPV) example 2:

- Acme can also outsource its HR Department
- Contract services cost \$150,000 per year (forever)
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- Immediate shut down costs = \$150,000
- Severance payments = \$250,000 (2 years)
- WACC is 10%



Selecting Growth Opportunities

- Profitability index
 - PV of revenue / investment cost
 - Greater than “1” is profitable
 - Higher the number – the more profitable
 - Acme project 1: $\$1,024,920 / \$800,000 = 1.281$
 - Acme project 2: $\$1,000,000 / \$584,000 = 1.712$
 - Higher PI indicates more productive project

• Net Present Value (NPV) example 1:

- Acme decides to purchase new equipment for \$800,000
- Cash flow from project estimated to be \$200,000/year
- Cash flow calculated as revenue – expenses (cash basis)
- Salvage value of equipment at end of year 7 = \$100,000
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• Net Present Value (NPV) example 2:

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- Severance payments = \$250,000 (2 years)
- WACC is 10%



Selecting Growth Opportunities

- Growth decisions summary
 - Multiple tools to pick most profitable project
 - NPV – favored approach – shows expected dollar return at cost of capital
 - IRR – provides project rate of return
 - Payback period – shows investment recovery time
 - PI – measures total percentage return expected



Selecting Growth Opportunities

- Growth decisions summary (continued)
 - Major investments require “saleable” presentations
 - Data must be reliable and verifiable
 - Risk must be defined and considered
 - Profitability demonstrated
 - Options if failure contemplated
 - Typically, not finance decision – Board decision

Final Contemplations

Two Rules of Finance



Two Rules of Finance

- Two rules of finance to consider:
 1. Debt is good
 2. Cash is bad



Two Rules of Finance

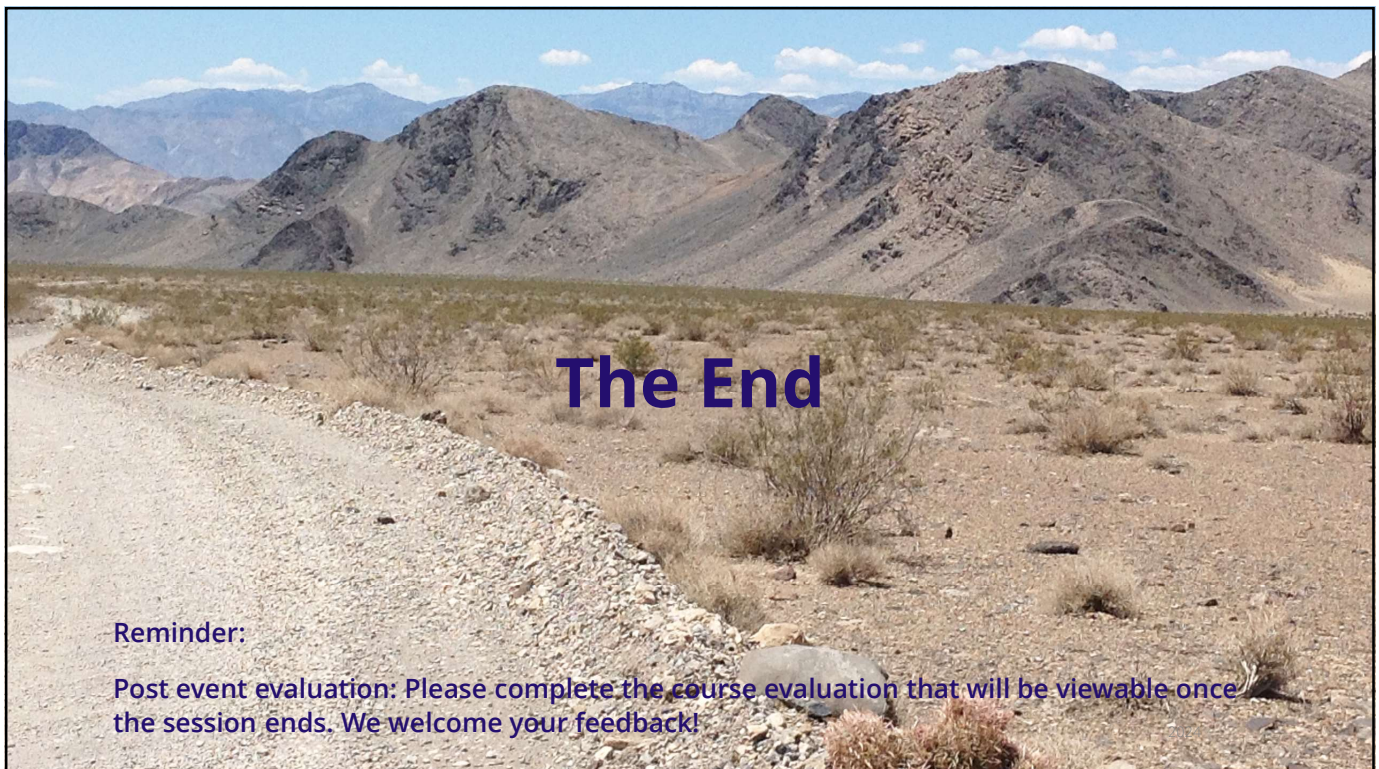
1. Debt is good
 - Less costly than equity
 - Tax shield lowers cost further
 - Use others' money to make money
 - Increases ROE without owner contribution of funds



Two Rules of Finance

2. Cash is bad

- Does not earn a rate of return
- Produces no ROA benefit for the business
- "Wastes" invested funds
- Don't hoard it, put it to use



The End

Reminder:

Post event evaluation: Please complete the course evaluation that will be viewable once the session ends. We welcome your feedback!

