
Understanding the Financial Environment of Public Utility Firms

Sanford V. Berg

Joel F. Houston



Overview

Our plan is to help facilitate a series of discussions related to utility finance.

- We will pose a series of questions
- Houston: basic finance theory and current research.
- Berg: Cases applying concepts to utility situations.

Let's (together) Avoid

- Unasked Questions
- Unanswered Questions
- Unquestioned Answers

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Discussion Questions

1. What are the various players trying to accomplish?
2. What are the basic principles of finance and how do they relate to current regulatory issues?
3. What are the links between accounting and finance?
4. How is value created?
5. What determines the cost of capital?
6. What are the standard techniques for evaluating corporate investments?
7. How do we assess performance?

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Q1: What are the various players trying to accomplish?

- Corporate objectives of public utilities
- FPSC objectives

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Corporate objectives

- Chief financial goal : maximize shareholder wealth. Why is this an appropriate goal?
- Other financial objectives – why they should take a back seat to maximizing shareholder wealth.
 - Maximizing EPS
 - Maximizing market share
 - Maximizing growth
 - Maximizing return on capital
- The importance of non-financial objectives
 - “Balanced scorecard” approach?
 - Maximize shareholder wealth subject to society-imposed constraints?

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FPSC objectives

- Balance customer needs and maintaining a healthy corporate sector (that can raise capital).
- Strike a balance among consumer needs (price, reliability, environmental concerns, etc.)
- Balance long-run and short-run considerations.
- FPSC’s goal is not to guarantee strong financial performance but to create environment in which utilities can be successful.

It is important to understand the “feedback” between the regulatory environment and corporate performance.

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CASE 1: Benefits from Environmental Outlays

Environmental issues loom large for utility industries.

- Global Climate Change
- Water resource availability
- NIMBY Transmission Lines

Who benefits from policies and who pays the costs?

Should shareholders absorb higher costs through lower returns?

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Q2: What are the basic principles of finance and how do they relate to current regulatory issues?

- The time value of money
- Risk and return
- Valuation

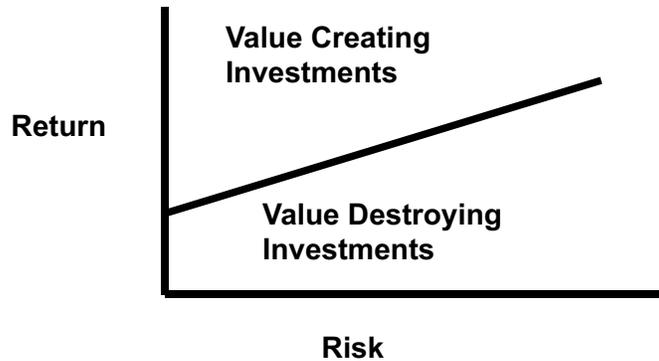
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The Time Value of Money

- Time Value of Money is one of the fundamental building blocks of finance.
- The value of any asset depends on the **level**, **timing**, and **risk** of its cash flows.
 - All else equal, larger cash flows are better.
 - All else equal, the sooner the cash is received the better.
 - All else equal, the less risk the better.
- An asset's value is the present value of its future cash flows. The discount rate used to discount the future cash flow depends on the level of risk.

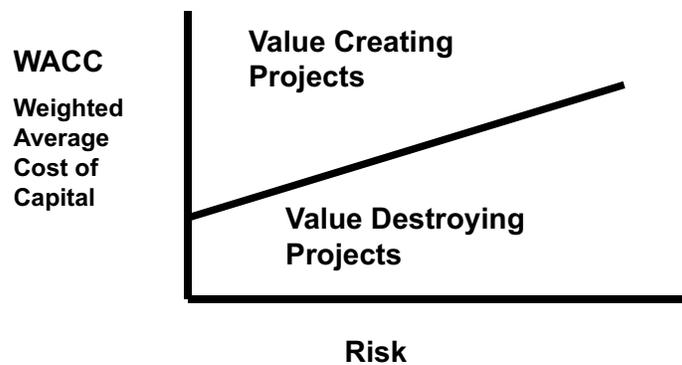
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Tradeoff between Risk and Return (Investor's Perspective)



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Tradeoff between Risk and Return (Corporate Perspective)



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Selected Realized Returns, 1926 – 2006

	<u>Average Return</u>	<u>Standard Deviation</u>
Small-company stocks	17.4%	32.7%
Large-company stocks	12.3	20.1
L-T corporate bonds	6.2	8.5
L-T government bonds	5.8	9.2
U.S. Treasury bills	3.8	3.1

Source: Based on *Stocks, Bonds, Bills, and Inflation: (Valuation Edition) 2007 Yearbook* (Chicago: Morningstar, Inc., 2007), p28.

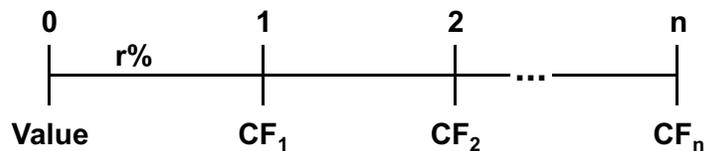
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Valuation

- The value of any asset is simply the present value of its cash flows.
- When estimating PVs, we discount future cash flows back to today's dollars. The discount rate is the "opportunity" cost of capital.
- Higher risk assets have a higher discount rate.

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Value of Financial Assets

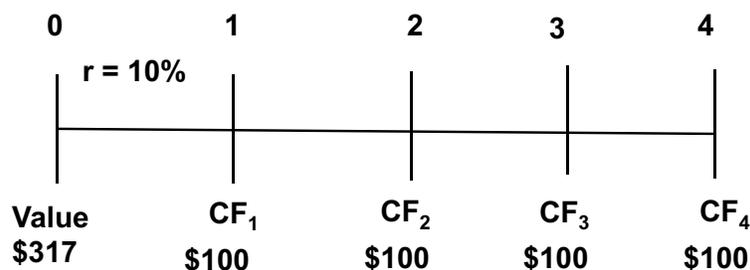


$$\text{Value} = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n}$$

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CASE 2: Input Price Risk

CF = Revenues – Outlays

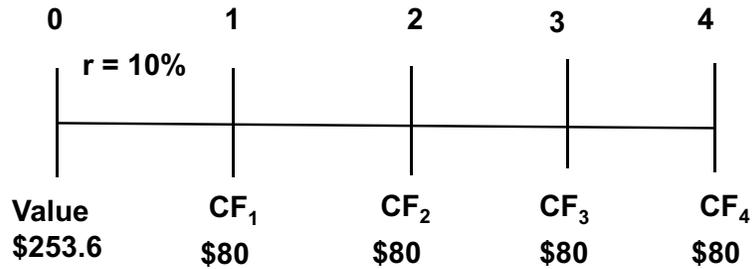


You would be willing to pay \$317 for \$100 per year for four years.
If you could earn 12% on your money, you would only value the annual CFs at \$303.70. The "project" would be worth less.

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CASE 2: High Input Price

CF = Unchanged Revenues – Higher Outlays



vs.
\$317

If the outlays, could be higher or lower, what happens to r ?
If $r = 12\%$, and CF could be \$80 OR \$120, what happens to
Expected NPV? Is it still \$317 or \$303.70?

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Q3: What are the links between accounting and finance?

- A corporation's chief financial objective is to maximize shareholder value.
- Accounting objectives should not dominate financial objectives.
- Nevertheless, it is important to understand accounting statements. Accounting is the "language of business". In this regard, understanding financial statements helps managers make decisions that enhance shareholder value.
- Regulators must understand the links also.

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Key Financial Statements

- Balance Sheet
- Income Statement
- Statement of Cash Flows
- Statement of Retained Earnings

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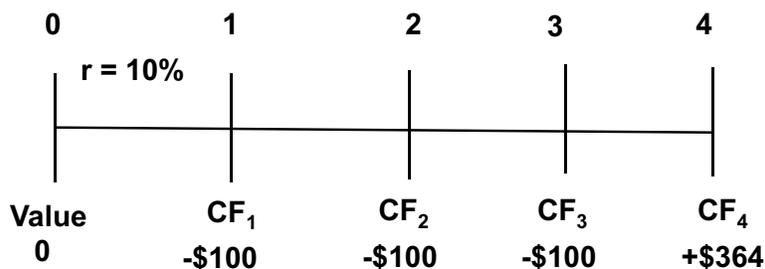
Questions Answered After a Quick Tour Through the Financial Statements

- How big is the company? Is it growing?
- Is the company making or losing money?
- What types of assets does the company hold?
- How has the company financed its assets?
- Does the company generate sufficient cash from its operations to finance its investing activities – or does it need external funds?

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CASE 3: Inter-temporal Cash Flows

Negative CFs = Build for three Years, **CF₄** brings all future CF to year 4



The PV of the outlays is \$248.7. The value in year 4 of all Future Cash Flows is \$364. This is equivalent to \$248.7 today, discounting at 10%.

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CASE 3: Inter-temporal Cash Flows: CWIP

Negative CFs = Build for three Years, but *Construction Work In Progress* put in rate base.



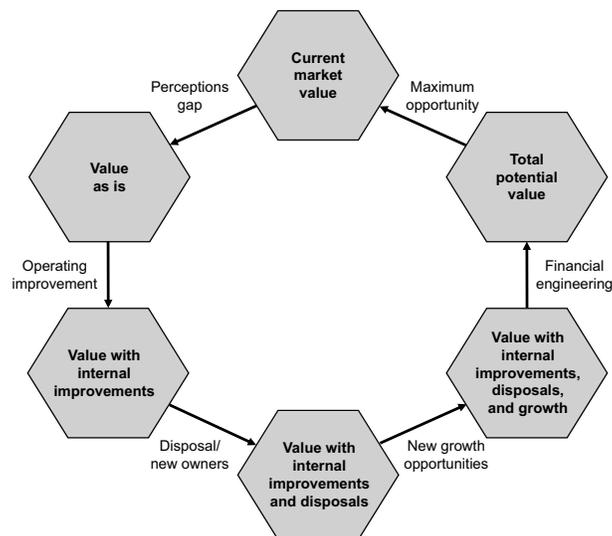
Depreciation and allowed returns *increases revenues*, reducing the annual "Net Outlay" to, e.g., \$85. PV of net outlays is \$211.40. Required future CF is **now \$309** (instead of \$364). *Future prices* (revenues) can be lower.

Q4: How is Value Created?

- For the Firm: Value is created whenever the return on capital exceeds the cost of capital. This is the simple notion behind measures such as Economic Profit and Economic Value Added (EVA).
- Regulators need to understand how managers are maximizing shareholder value (through cost reductions and revenue enhancements).
- The regulatory process establishes reporting requirements and incentives that affect economic value added.
- The process also determines how the value is allocated between investors and consumers over time.

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EXHIBIT 2.2 CORPORATE STRATEGY FRAMEWORK



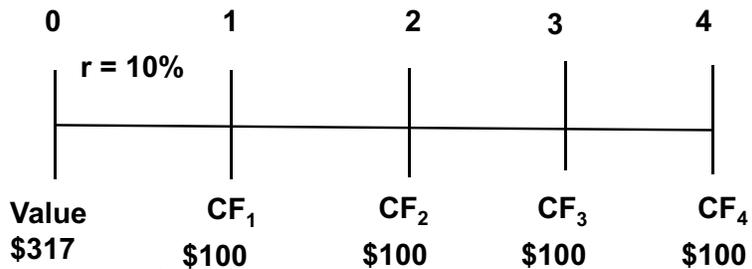
Recent HBR Article – 10 Ways to Create Shareholder Value

1. Don't manage or guide earnings. (1&2)
2. Focus on value enhancing acquisitions.
3. Carry only assets that maximize value.
4. Return excess cash.
5. Provide the right incentives inside the corporation (6-9)
6. Provide investors with value-relevant information

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CASE 4: Conservation & Energy Efficiency

CF = Revenues – Outlays



An outlay today of \$317 that saves customers \$100 per year for four years is beneficial for consumers with a 10% discount rate. What if their rate is higher (or lower) than 10%? What if other (social) benefits equal another \$20 per year? How is the utility to be compensated for their investment and lost revenue?

Q5: What determines the cost of capital?

$$WACC = w_d r_d (1 - T) + w_p r_p + w_c r_c$$

- The w 's refer to the firm's capital structure weights.
- The r 's refer to the cost of each component.

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What are the factors that influence the cost of capital?

- Market conditions
 - Changing interest rates
 - Changing price of risk
- Operating risk
 - Technical risk of plant and system operations
 - Commercial (demand) risk
- Financial risk (capital structure—debt and equity)
- Regulatory risk (policy predictability)

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Issues that arise when estimating the WACC

- What gets included?
- Calculating capital structure weights
- Calculating the cost of debt
- Calculating the cost of equity

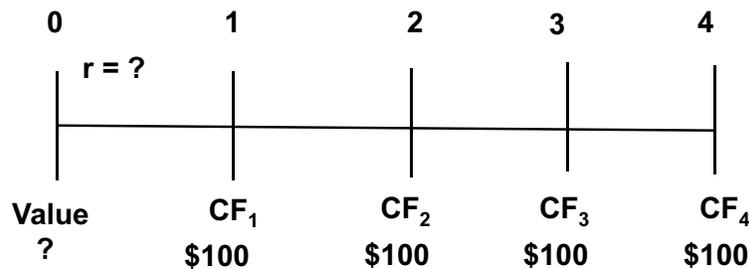
Consider two perspectives:

- Forward looking WACC
- Historically grounded WACC (interest on past debt).

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CASE 5: Perceptions of Risk

Investors, Managers, and Regulators



Project A: \$303.70 at 12%
Project B: \$317 at 10%
Project C: \$331.20 at 8%

Investors, managers and regulators may have different estimates of risk, of project cost, and operating CFs.

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Q6: What are the standard techniques for evaluating corporate investments?

- Criteria for evaluating projects
- Estimating relevant cash flows
- Estimating the risk (cost of capital) of the project
- Incorporating relevant options

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Criteria for evaluating projects

- Net present value (NPV)
- Internal rate of return (IRR)
- Payback

Standard finance theory suggests that “unconstrained firms” should use NPV as the primary criteria for evaluating projects.

- Simple decision rule:
 - Independent projects; Accept if $NPV > 0$
 - Mutually exclusive projects: Accept project with highest NPV
- Are firms capital constrained? What should they do if they are constrained?

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Estimating relevant cash flows

- Analyst should focus on incremental cash flows:
 - Ignore sunk costs
 - Include opportunity costs
 - Include externalities
- Note: The valuation approach still works even for those projects that don't directly produce positive cash flows.

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Estimating project risk

- Three types of risk
 - Stand-alone risk
 - Corporate risk
 - Market risk
- Market risk is arguably the most relevant, but the most difficult to estimate
- Techniques for evaluating risk
 - Sensitivity analysis
 - Scenario analysis
 - Monte-Carlo simulation
 - Value at Risk analysis
- Understanding the feedback between risk and value

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Incorporating Relevant Options

- Timing options
- Abandonment options
- Growth/expansion options
- Flexibility options (potential changes in national energy/environment policy)

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CASE 6: Timing and Options

E (Invest Year 1) vs. F (Invest Year 2)

0	1	2	3	4
$r = 10\%$				
Value	CF ₁	CF ₂	CF ₃	CF ₄
E: \$24.0	-\$200	\$100	\$100	\$100
F: \$81.5	\$0	-\$150	\$100	\$190.9

Project E: has an investment outlay in year 1, and yields CF three yrs.
Project F: Delayed investment. CF in year 4 brings CF = \$100 in year 5
back to year 4, so each Project operates for three years.

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Q7: How do we assess performance?

- This is a very important issue, that obviously relates to our first series of questions concerning the proper objectives.
- When things turn out differently than planned (which they often do!), what is the proper course of action?
- What do we hold people accountable for?
- How do we avoid giving blame for events beyond one's control?
- How do we avoid giving credit for events beyond one's control?
- Who should bear the risk?
- How do we provide incentives for continued improvement and innovation?

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Other Applications

- Securitization
- Deferred Taxes
- Accelerated Depreciation
- Sinking Funds
- Futures Markets for Inputs
- Weather Derivatives
- Links between rate design and cash flows

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Appendix 1: Links Between Various Statements

- Net income is linked to statement of retained earnings. Statement of retained earnings is linked to retained earnings reported on balance sheet.
- Depreciation expense on the income statement is related to accumulated depreciation on the balance sheet – which in turn affects net PPE (Property, Plant, & Equipment).
- Statement of cash flows demonstrates how much cash the company has at a point in time. The level of cash is reported on the balance sheet.
- Other links – statement of cash flows shows how much money was used to purchase new fixed assets – the change in fixed assets also shows up on the balance sheet, etc. etc.

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Balance Sheet Gives a “Picture” of Assets and Claims at a Point in Time

ASSETS		LIABILITIES AND EQUITY	
Cash and Securities	\$ 200	Accounts Payable	\$ 200
Accounts Receivable	300	Accruals	100
Inventory	<u>400</u>	Notes Payable	<u>500</u>
Total Current Assets	\$ 900	Total Current Liabilities	\$ 800
Net Property Plant & Equipment	<u>2,100</u>	Long-Term Debt	800
Total Assets	<u>\$3,000</u>	Common Stock	500
		Accumulated Retained Earnings	<u>900</u>
		Total Equity	<u>\$1,400</u>
		Total Liabilities and Equity	<u>\$3,000</u>

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Income Statement Shows If We Made or Lost Money during Some Period

	Year t
Sales	\$100,000
Operating Costs excluding D&A	<u>70,000</u>
EBITDA	\$ 30,000
Depreciation	<u>10,000</u>
EBIT	\$ 20,000
Interest Expense	<u>8,000</u>
EBT	\$ 12,000
Taxes	<u>4,500</u>
Net Income	<u><u>\$ 7,500</u></u>

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Statement of Cash Flows shows how much cash was generated or used during the year

- Changes in cash = cash from operating activities + cash from investing activities + cash from financing activities.
 - Cash from operating activities: Start with net income add back depreciation and amortization, and make adjustments for changes in working capital.
 - Cash from investing activities: Related to changes in fixed assets. Capital expenditures reduce cash. Asset sales generate cash.
 - Cash from financing activities: Raising capital generates cash; returning capital to investors reduces cash.

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Statement of Retained Earnings

Balance of retained earnings, 12/31/06	\$203,768
Add: Net income, 2007	60,176
Less: Dividends paid	<u>11,000</u>
Balance of retained earnings, 12/31/07	<u><u>\$252,944</u></u>

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Appendix 2: Economic Value Added

- Value is created whenever the return on capital exceeds the cost of capital. This is the simple notion behind measures such as Economic Profit and Economic Value Added (EVA).
- Economic Profit = $(\text{ROIC} - \text{WACC}) \times \text{Total Invested Capital}$
- EVA = $\text{EBIT}(1 - T) - \text{WACC} \times (\text{Total Invested Capital})$.
- Note: $\text{NOPAT} = \text{EBIT}(1 - T)$
 $\text{ROIC} = \text{NOPAT} / \text{Invested Capital}$

SO – ECONOMIC PROFIT AND EVA ARE ESSENTIALLY THE SAME IDEA. 46

EVA Concepts

- EVA takes into account the total cost of capital, which includes the cost of equity.
- EVA is not a cash flow measure. It attempts to measure the true economic benefits and costs of a firm, division, or project.
- In practice, adjustments are needed.

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EVA and ROE

- Another way to express EVA is:
 $\text{Net Income} - (\text{Cost of equity}) \times (\text{Equity})$.
- Therefore, $\text{EVA} > 0$ if:
 $\text{ROE} > \text{Cost of equity}$.
- ROE still does not take into account the size of the investment. A division may have a higher ROE, yet a lower EVA if it is smaller than another division.

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Economic Profit (EVA) vs. DCF

- Economic Profit
 - = Invested Capital*(ROIC-WACC)
 - = NOPLAT - (Invested Capital*WACC)
 - (Remember ROIC=NOPLAT/Invested Capital)
- With some algebra, we can show that discounted economic profit equals discounted FCF.
- Similarly, a project's NPV is equivalent to the present value of its discounted economic profit.
- Timing matters however – implications for compensation schemes.