Cost Measurements (Ch 5)

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Depreciation

Review from Intro to Costs

Assets cost a lot and while purchased in one year provide benefits over many years. We would like to allocate cost of purchasing that asset over the years we use it (Matching principle).

- When you buy the asset (Balance Sheet) it is in the rate base and earns interest
- Every year some of the purchase price turns into depreciation (Income statement) and passed on the consumers.
- Ideally, sale of an asset should result in no income changes but it almost always happens.

Extended Numerical Example

- Data Needed to Depreciate an Asset
  - Service Date
  - Cost Basis
  - Asset Life
  - Salvage Value
  - Method, accelerated, straight line, etc.

Example

- Asset goes into service now.
- Cost 10K
- Will last five years
- Salvage for 2K
- Tax uses MACRS but we will use straight line.

Depreciation each year:

$$\frac{(Cost - Salvage)}{Life} = \frac{10K - 2K}{5} = 1.6K$$

The book spends a few pages doing this in percentage terms but that is more about the "Iowa Curve" methodology, what survival analysis looked like in the 1950s

Example Continued

Year	Depreciation	Book
0	0.0	10.0
1	1.6	8.4
2	1.6	6.8
3	1.6	5.2
4	1.6	3.6
5	1.6	2.0

The Book Value is the cost basis less accumulated depreciation. This is in the rate base and earns the allowable return.

Example to Revenue Requirement

All the depreciation is part of the revenue requirement and with an allowable rate of return of 10%, 10% of the book value.

Year	Depreciation	Book	RR
0	0.0	10.0	0.00
1	1.6	8.4	2.44
2	1.6	6.8	2.28
3	1.6	5.2	2.12
4	1.6	3.6	1.96
5	1.6	2.0	1.80

Asset Retirement Obligations

Now lets add in that a site will need to be cleaned up or that it is expensive to decommission. In this case 5K.

- Every year, take an equal amount as an expense.
- Add to the rate base, it earns interest in the rate base.
- When you decommission, remove it from the rate base but don't add it as an expense since you already did.

Year	Depreciation	Book	RR	Decomission	ARO
0	0.0	10.0	0.00	0	0
1	1.6	8.4	3.54	1	1
2	1.6	6.8	3.48	1	2
3	1.6	5.2	3.42	1	3
4	1.6	3.6	3.36	1	4
5	1.6	2.0	3.30	1	5

Disallowance

Examples of Dissallowance and the Reasons Why

Disallowance is the technical term for not including an expense or an asset in the rate base.

Key terms:

- Used and Useful: Comes from Smyth v. Ames (1898) and says physically used and useful to current rate payers before they can be asked to pay for it. There are some exceptions.
- Prudent: Makes sense at the time it was made. Not penalized for not knowing the future.

Examples of Dissallowance in Orgon

- Trojan Nuclear Power Plant (PGE) `http://www.puc.state.or.us/admin_hearings/key_puc_cases/95_322.pdf`
- Multiple Wind Projects (PacifiCorp) `https://apps.puc.state.or.us/orders/2008ords/08-548.pdf`

Trojan

PacifiCorp Wind Projects

Regulated Rate of Return

What we will look at

- The effects of capital structure on the rate of return
- The rarity of using actual structure and a framework for choosing one in a regulatory framework.
- Technical problems:
  - Subsidiarys
  - Used assets
- Three ways to estimate ROE and a critique.

Earnings Volitility and Debt

Why Assume a Structure Rather than Measure

Criteria for an Assumed Structure

http://www.sciencedirect.com/science/article/pii/S1040619011001722

Technical Issues

- Subsidiaries
- Used Assets

Subsidiary

Used Assets

Return on Equity (ROE)

Usual Methods and an Unavoidable Assumption

Methods: + Discounted Cash Flow (DCF) + Capital Asset Pricing Model (CAPM) + Risk Premium Model (RPM)

Sitting under all of them is one of the efficient market assumptions.

Three Basic Kinds of Efficient Market Assumptions

Usefulness of information to predict future prices

- Weak: All past price data will not help.
- Semi-Strong: Public data does not help
- Strong: No data public or private can help

Grampa Ish and Betting on Horses

- You don't know who will win.
- Calculate your own odds of each horse.
- Bet the horse that is paying off more than you think it should.
- You win more often if you have your grandson talk to the jockeys.

Behavioral Finance

- Behavioral Economics has a brother.
- There are plenty of anomalies
  - Monday Effect, French (1980)
  - January Effect, Roll(1983)
  - Firm Size, Banz(1981)
  - Mean Reversion, DeBondt and Thaler (1985)
  - Momentum, Jegadeesh (1990)
- Anomalies get smaller after a paper about it is published.
- Many critiques have to do with statistical details.

Comparable Data

The intent is to have observations of a firm just like the one being regulated but without the effect of regulation.

- The intent is a quasi-experimental control.
- Comparability is easier to work with for populations but harder for an individual.
  - There is no perfect match
  - The Parable of the Cookie and Parent's Problem.

DCM

CAPM

RPM