

Intro to Costs

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Overview

Where we are headed and why

- ▶ Regulated firms must be able to meet their revenue requirement.
 - ▶ There are many rate structures that can get them there but you need to know the number.
- ▶ The requirement has two parts:
 - ▶ Expenses - which pass through to the rate payer. This roughly corresponds to things on the *income statement*.
 - ▶ Rate Base - which the firm earns a 'fair' rate of return on. Roughly corresponds to thing on the *balance sheet*.

What Does Accounting Do?

Accounting

- ▶ There are rules and standards in accounting. This is a specialist area.
- ▶ Overarching principles in each country are usually called *Generally Accepted Accounting Principles*.
 - ▶ Our rules are what the SEC decides.
- ▶ There are additional principles in addition depending on domain.
 - ▶ Government uses Governmental Accounting Standards Board (GASB) in addition
 - ▶ You will also see some very specific systems such as FERC's *Uniform System of Accounts*. <http://www.ecfr.gov/cgi-bin/text-idx?c=ecfr&SID=054f2bfd518f9926aac4b73489f11c67&rgn=div5&view=text&node=18:1.0.1.3.34&idno=18>

The rules have goals

- ▶ Helpful to potential investors and creditors
- ▶ Helpful for making financial decisions
- ▶ Helpful in making long-term decisions
- ▶ Helpful in improving the performance of the business
- ▶ Useful in maintaining records

And Principles to achieve those goals

- ▶ Historical Costs – You have receipts for things. But, many asset values are adjusted periodically to a “fair” or “market” value.
- ▶ Recognition – Disconnected to when cash is sent and received but that the obligation is there.
- ▶ Matching – So you can compare incremental costs and benefits. Not everything can be matched.
- ▶ Full Disclosure – More detail is better but there is a limit.
- ▶ Consistency – Don't change the rules and accounts from year-to-year
- ▶ Conservatism – Tend to overstate costs and understate revenue

Basics of Financial Accounting

Financial?

- ▶ Just means watching the transactions.
- ▶ Three main documents:
 - ▶ Balance sheet – What can be owned and who owns it.
 - ▶ Income statement – Revenue and expenses
 - ▶ Cash Flow – sinks and sources of cash
- ▶ Avoiding the cash flow statement today.

Intro to Balance Sheet and Income Statement

- ▶ This material is from my EC314 course.
- ▶ <https://prezi.com/agobxmlocjgj/accountingquiz/>
- ▶ For Additional Details:
<http://woodsecon.wikidot.com/basic-accounting>

Specifics for Economic Regulation

Introduction

- ▶ Don't get freaked out because there are three sets of books.
 - ▶ Financial for the investors
 - ▶ Tax for the government
 - ▶ Regulatory for the regulators
- ▶ Accounting recognizes you can't fully commit to three rules.
 - ▶ The obligation to maximize value to shareholders, and therefore to minimize taxes, means you arrange transactions differently for tax purposes.
 - ▶ Regulatory requirements, often related to accurate asset lives, are in conflict with tax treatment, which often bias asset lives low.

Breakdown Without Details

- ▶ $Revenue\ Requirement = Expenses + (Rate\ of\ Return)Rate\ Base$
- ▶ *Expenses* are generally on the income statement, but there are a few things that start on the balance sheet and move over to income statement.
- ▶ *Rate Base* is generally on the balance sheet, but there are a few things that move back and forth between balance and income.

Not without controversy. Here is recent LA Times on California

<http://www.latimes.com/projects/la-fi-electricity-capacity/>

More Detail in Later Chapters

- ▶ Ch 5: Depreciation, Rate of Return, Rate Base for the firm as a whole.
- ▶ Ch 6: Allocating the above to rate classes
- ▶ Ch 7: Including the future into the income statement items (expense) and the need for balance sheet items (Rate Base).

Deferred Costs

You paid for it now, but it won't be an expense till later.

- ▶ Personal Finance Example: You pay next month's rent this month.
- ▶ Becomes an asset.
- ▶ Because it is an asset is included in the rate base.

Generally this is for big, “material” is the word of art, things. Some of these are sinking funds, savings accounts for future events.

Accrued Costs

Things you have not paid for but owe.

- ▶ Personal Finance Example: Your electric bill
- ▶ Becomes a liability
- ▶ Generally smaller things but included in working capital.

Just about every cost is accrued. Relatively rare to recognize the expense when you actually pay it.

Direct Costs

These are the easy ones. They are the pairs at the top of the income statement. They always have a close relationship.

After that it can get odd :

- ▶ Selling, General and Administrative expenses are not just for one product
- ▶ Tend to break them into “Joint” and “Common”
- ▶ Distinction is rare in financial but common in cost and regulatory accounting

Joint vs Common

There are official definitions but these are easier:

- ▶ Joint used for several products at the same time. Complements in production.
- ▶ Common used for several products but *not* at the same time. Substitutes in production.

Gets complicated quickly (Sausage Making Example):

- ▶ Grind meat (Joint). Note we added effort and used the grinder for all the things at once.
- ▶ Grab some for lunch.
 - ▶ Most is still *joint* for sausage but
 - ▶ Now I have a common cost, my lunch.
- ▶ I split the meat into three groups for different kinds of sausage, now the ground meat is common.
- ▶ I add separate seasonings for each (Direct).

Large One-Time Costs

- ▶ Most costs are on the income statement and flow through directly to the revenue requirement. Fuel cost for example.
- ▶ Some are so large they would have a material effect on rates if they were expensed, so you spread them out.
- ▶ Regulatory and Financial rules may split on this.
- ▶ Research and Development Example
 - ▶ Spend money every year to develop a new product.
 - ▶ Some is expensed, if you are uncertain of future benefits (Income Statement)
 - ▶ Some is capitalized (Balance Sheet)
 - ▶ The capitalized part is amortized (Income Statement) over years

Pretty big incentives to capitalize. Shareholders get the money back with interest.

Depreciation

What is depreciation? Many definitions and ways of thinking about it. The core is simple.

- ▶ 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).
- ▶ There are things like depreciation, amortization (What you use for R&D and One-time expenses) and depletion (When removing oil or trees reduces the value of an asset.) but depreciation is the most complex.

Depreciation in Action: Year of Purchase

The Frame:

Income	Balance	Cash Flow
R(evenue)	A(ssets)	Op(erations)
E(xpenses)	L(iabilities)	Inv(estments)
Net Income	O(wner) E(quity)	Fin(ance)

How Used: Example buy an asset. Note: No expenses.

Income	Balance	Cash Flow
R	A ↑↓	Op
E	L	Inv ↓
	OE	Fin

- Cash down from investing. Increase in a fixed asset (What you bought). Decrease in a current asset (Cash)

Depreciation in Action: Following Years

Income	Balance	Cash Flow
R	A ↓	Op ↑↓
E ↑	L	Inv
↓	OE↓	Fin

Income Statement:

- ▶ Some of the asset value is taken as a depreciation expense. $E \uparrow$
- ▶ The expense lowers taxable income and taxes but
- ▶ Lowers net income (profit) ↓

Depreciation in Action: Following Years

Income	Balance	Cash Flow
R	A ↓	Op ↑↓
E ↑	L	Inv
↓	OE↓	Fin

Cash Flow Statement:

- ▶ Net income is a source of cash for operations. $Op \downarrow$ but it is lower by $(tax\ rate)Depreciation$.
- ▶ Depreciation is added back in as a source of cash from operations $Op \uparrow$.
- ▶ The logic:
 - ▶ Cash already left to buy the asset.
 - ▶ Nobody to pay the depreciation bill to but yourself.

When you sell the asset

Income	Balance	Cash Flow
R	A ?	Op $\uparrow\downarrow$
E ?	L	Inv \uparrow
	OE	Fin

- ▶ When you sell assets go up (Cash) and down (Fixed) and there is an inflow of cash.
- ▶ If sold for something other than book value, what is on the balance sheet.
 - ▶ Depreciation and the tax savings are trued up.
 - ▶ There could be losses or gains from sale that show on income statement.

In summary

- ▶ 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.

Why Depreciation Gets Complicated

- ▶ Different depreciation for financial, tax and regulatory purposes.
 - ▶ Best tax treatment is under MACRS. More depreciation sooner and less later means more tax saving sooner and less later.
 - ▶ Short lives, <https://www.irs.gov/pub/irs-pdf/p946.pdf> p. 108
 - ▶ Financial tends to be straight line
 - ▶ Regulatory varies considerably from jurisdiction to jurisdiction
- ▶ Depreciation based on use.
- ▶ Assets Under construction.
- ▶ Not being used

Mark-to-Market and other asset re-valuation

- ▶ Good idea
 - ▶ Give a truthful reporting of how much debt and equity are really worth.
 - ▶ Use all the data you have to make that assessment.
- ▶ Sometimes called mark-to-model or mark-to-fantasy
- ▶ Can be implicated in quite a few financial crises, which see every few years.
 - ▶ Some great depression deepened by MTM, asset values crashed balance sheets.
 - ▶ S&L crisis in 80s. Not marking to market hid problems.
 - ▶ Enron valued securities in ways that didn't make sense mark-to-model

Public Utilities Have Long-lived Assets

- ▶ Many choices on how to value them:
 - ▶ Historical Cost less depreciation
 - ▶ Replacement costs : Make a new one with modern technology
 - ▶ Reproduction cost : Old school tech
 - ▶ Value of service: Present Discounted value of what it produces
- ▶ The real question, If you don't know future environmental regulation, how do you value thermal generators?

Taxes

- ▶ This seems simple, Taxes are an expense, so, pass the expense on to the consumer.
- ▶ But ...
 - ▶ Tax depreciation is different than regulatory depreciation
 - ▶ Tax savings is front loaded in MACRS.
 - ▶ Normalization spreads it out.
- ▶ This encourages states to use the utility as a tax collector
 - ▶ Oregon has rules limiting this. <https://secure.sos.state.or.us/oard/displayDivisionRules.action?selectedDivision=4036>
 - ▶ OAR 860-022-0040
 - ▶ OAR 860-022-0042

Alternate Proposals on Taxes

- ▶ Remember M97, the gross receipts tax that did not pass?
- ▶ That would have been passed through to the consumer.
- ▶ Some economists propose
 - ▶ Eliminating corporate tax
 - ▶ Tax long-term capital gains at the same rate as ordinary income

Would fix a lot of distortions in the economy but this is a topic for your public finance class, not public utility. Also, it needs to be done at the Federal level.

Working Capital

- ▶ Another phrase with multiple meanings depending on context.
 - ▶ Inventory and accounts receivable
 - ▶ Current assets less current liabilities
- ▶ Our context is just cash on hand to cover the friction between cash from revenue comes in and cash from expenses goes out.
 - ▶ Often just a rule of thumb 30 or 45 days of expenses.
 - ▶ Or study of accounts receivable and accounts payable ageing.

In any case it is in the rate base (balance sheet) and earns interest.

Return on Capital Assets

- ▶ Lots of fighting time here
- ▶ Key parameters
 - ▶ Cost of debt (Bonds)
 - ▶ Cost of equity (Stock)
 - ▶ Capital structure (Balance of Stock and Bonds)
- ▶ Seems easy but often the reasoning is circular
- ▶ Lots of details in Ch 5

Circular How?

- ▶ One way to value a stock
 - ▶ Find the expected dividend rate and expected appreciation rate
 - ▶ NPV is the value of the stock.
 - ▶ But the dividend rate and appreciation rate depend on the rates that are set.
 - ▶ Rates depend on the revenue requirement.
 - ▶ Back where you started

There are ways around this with CAPM and others.

Capital Structure

- ▶ Capital structure generally describes the blend of stocks and bonds that the firm issues.
- ▶ There is a concept of an ideal capital structure
 - ▶ Debt ratio, $\frac{\text{Liabilities}}{\text{Assets}}$
 - ▶ As Debt ratio increases, the market requires high interest rates on bonds.
 - ▶ As Debt ratio increases, the market requires lower expected dividends.
 - ▶ Ideal is a debt ratio where the cost of issuing new bonds is equal to the cost of issuing new equity.

Example

Ideal is rare in practice for public utilities. Gas and electric tend to be very close to .5

Next Reading

- ▶ Ch 5 of Lesser where we hit the details.
- ▶ Expect homework.