Choice

Goals

- Be able to make a *financial* argument for the choice of one asset over another.
- Be able to use all the criteria depending on client needs.
- Do some calculator practice.

Convergent Development

- Both Engineering and Economics developed Cost/Benefit analysis ideas in parallel.
- Many similarities but . . .
  - Engineers focus on the money alone and certainty style analysis
  - Economists focus on welfare, money plus opportunity costs, and like the dealing with randomness.
- The side-effect is a lot of misunderstandings and a lot of complaints about goofiness on all sides.

There are rule books

Here is one for energy efficiency evaluation.

`https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf`

Your industry may, or may not, have one, but you should find out the quirks in the usual rules for your industry.

Some rules may be odd because of:

- Actual laws and regulations (the details legislators didn't write.)
- Case law.
- Local and unwritten past practice.

Things you need to know to make a choice

- The kind of choice (Environment), e.g., exclusive choice
- The assets
- The minimum acceptable rate of return (MARR), an interest rate
- The planning horizon
- The preferred criteria

Two Envioronments

We only work with four environments in this class.

- *Unconstrained Choice*: Pick the *acceptable* assets.
- *Exclusive Choice*: Pick the *best* asset.
- Increasing Cost of Funds: Pick acceptable assets when you face many interest rates.
- Capital Budgeting: Pick the best group of assets when limited on how much you can spend.

How we Describe Assets

- As a finite menu of choices, e.g., A, B, C, D, E.
- It could be a list like:
  - French Frys, oninion rings, cheese sticks, deep fried oreo.
  - or Cash Flows

Year	A	B	C
0	0	0	0
1	10	0	0
2	0	10	20

Synthetic Assets

The Three + One Tests

Basic, no calculation, ideas

This is from the pre-test

Year	A	B	C
0	0	0	0
1	10	0	0
2	0	10	20

- More in the same time period is better, $C \succ B$
- Same amount sooner is better, $A \succ B$
- Anything other than these two pure cases requires some computation.

Simple Payback

- Warning
  - This one is not consistent with the others and does not always give the same choice.
  - In common use as a pre-test

Why Simple Payback Fails

Using exclusive choice for counts