2.964: Economics of Marine Transportation Industries
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Lecture Notes: Time Value of Money

Discount Rates

$PV(B_n) = B_n \cdot \frac{1}{(1+r)^n}$

What is correct discount rate (r) to use to evaluate investment decisions?
- individual
- corporation
- government (society)

Considerations
1) inflation, real vs. nominal $
   = Δ in prices
   Q: which prices? → different ways of measuring of inflation
   consumer price index
   producer price index
   → be consistent, use real $ when possible
2) cost of capital
   a. risk free – U.S. government bonds
   b. risk premium
   c. uncertainty in projections } r_{RP}
   $r = r_{RF} + r_{RP}$
   - r_{RF} is same for government, private
   - r_{RP} is greater for private because government can be source of risk
   represents uncertainty about future projections

Private discount rate > Social discount rate
→ faster exploitation of natural resources

Net Present Value = $\sum_{i=1}^{n} \frac{B_i - C_i}{(1+r)^i}$

Payback (period) – how long until $ back?
not a real measure of profitability

IRR
- discount rate that results in present value = 0
- example: $3000 inv. yields $1000/year…
- timing of flows √
- assumes all cash can be invested at same rate ?

NPV
- choose discount rate ("cut-off rate")

Role of financing ("other people's money" or OPM, "leverage")
- compare projects with equal (or no) leverage

Example		@ 10% discount rate
	$100m now	-100.0
2: (next yr)	$50m payment	+45.5
3:	$100m -> yard	-82.6
4:	$200m payment	+150.0
		+12.9 @ 10%