

Economic Analysis

- Two aspects of economic analysis are important in production system design:
 1. *Costing*: determine the unit cost of a production activity (e.g., \$2 per mile for TL shipments (actually \$1.60/mi))
 - Termed “should-cost” analysis when used to guide procurement negotiations with suppliers
 2. *Project justification*: formal means of evaluating alternate projects that involve significant capital expenditures

Costing

- Capital recovery cost used to make *one-time* investment costs and salvage values commensurate with *per-period* operating costs via discounting

$$\text{Effective cost: } IV^{\text{eff}} = IV - SV(1+i)^{-N}$$

$$\text{Capital recovery cost: } K = IV^{\text{eff}} \left[\frac{i}{1 - (1+i)^{-N}} \right] = (IV - SV) \left[\frac{i}{1 - (1+i)^{-N}} \right] + SV \cdot i$$

$$\text{Average Cost: } AC = \frac{K + OC}{q} \neq \frac{IV^{\text{eff}} + PV \text{ of } OC}{Nq}$$

where

IV = initial one-time investment cost

SV = one-time salvage value at time N

OC = operating cost per period

q = units per period

