Capacity Allocation Using Turn-and-Earn

When demand exceeds capacity..

Supplier

K: capacity
c: unit cost for building capacity
w:wholesale price
Allocation rule

Retailer 1 → $P=a-q_{t1}$

Retailer 2 → $P=a-q_{t2}$

Demand:
HIGH: $a=1$ with prob. ϕ
LOW: $a=\alpha<1$ with prob. $1-\phi$

Timeline

Retailers choose first period order quantity (q_{1i})

Retailers choose second period order quantity (q_{2i})

PERIOD 1 (low demand)

PERIOD 2 (uncertain demand)

Supplier
- chooses production quantity/capacity K
- chooses w
- chooses allocation rule

Period 2 demand state is realized