

## Empirical work on transaction costs

$C_0$  - cost of transacting inside the firm

$C_m$  - cost of transacting in the mkt.

Assume:

- $C_0 = \alpha X + e$

- $C_m = \beta Z + u$

$$\Pr[\text{Internal org.}] = \Pr[C_0 < C_m]$$

$$= \Pr[e - u < \beta Z - \alpha X]$$

- Not easy to estimate  $C_0, C_m$ .

- Can obtain at best some proxies of  $X$  and  $Z$ .

- use discrete choice model to obtain  $\alpha, \beta$ .

Problems:

- many papers look at  $X$ 's, but not the  $Z$ 's.

- papers typically assume orthogonality of  $X$ 's and  $Z$ 's.

- If  $X, Z$  share common variables, can not separately identify  $\alpha_k, \beta_k$ . Can sign  $\beta_k - \alpha_k$ , though.

Monteverde and Teece look at automobile industry and find many different degrees of vertical integration.

- They focus on asset specificity as a proxy for the  $X$  variables:

Masten looks at vertical integration in the aerospace industry in a similar way

- look at make or buy decision

### Hubbard

- Recognizes a continuum of organizational structures
- looks at trucking industry.
- There are network effects and regulation issues that are not taken into account
- Uses an ordered logit approach
- later looked at effects of GPS adoption on ownership structure.

### Antitrust Law

- RPM (Resale price maintenance)
  - per se illegal
  - maximum RPM treated under rule of reason.
    - ie double marginalization problem could justify maximum RPM
- Exclusive territories and customer restrictions
  - Now viewed under a rule of reason

- Exclusive dealing and full requirements contracts.
- Tying contracts
  - per se illegal if mkt share is large
  - otherwise, rule of reason.

## Regulation of Natural Monopoly

- What is a natural monopoly?
- What are the goals of regulation?
- Optimal regulation
  - complete info.  $\Rightarrow$  1<sup>st</sup> best
  - incomplete info.  $\Rightarrow$  2<sup>nd</sup> best

An industry is characterized by a natural monopoly if cost fn is subadditive

- $c(x_1) + c(x_2) \geq c(x_1 + x_2)$

Behavioral: subadditivity + sunk costs give either:

- 1] Single firm  $\Rightarrow$  excessive price
- 2] Multi-firm oligopoly  $\Rightarrow$  excessive costs
- 3] Unstable dynamics

Cost penalty to dividing production should be sufficiently high to warrant intervention

## Formalizing subadditivity

◦ homog. prod, ident-firms, cost fn  $C(q)$

◦  $Q = q_1 + \dots + q_N$

◦  $C$  is subadditive if

$$C\left(\sum_{i=1}^N q_i\right) < \sum_{i=1}^N C(q_i)$$

◦ Multiproduct analog

◦  $q^i = (q_1^i, \dots, q_m^i)$

◦  $q^1, \dots, q^N$

◦  $Q = \sum_{i=1}^N q^i$   
vector

◦  $C\left(\sum_{i=1}^N q^i\right) < \sum_{i=1}^N C(q^i) \Rightarrow$  subadditive

◦ combination of:

1] economies of scale

2] economies of scope

Sufficient conditions:

1]  $C(q^1 + q^2) - C(q^2) \geq C(q^1 + q^2 + q^3) - C(q^2 + q^3)$

2]  $\frac{\partial^2 C}{\partial q_i \partial q_j} \leq 0 \quad \forall q_i, q_j$

3]  $AJ(C) = [C(q_1 + q_2) - C(q_2)] \frac{1}{q_1}$

## Traditional Approach

- Estimate translog cost functions
- simulate costs under alternative market structures
- what is the counterfactual?
- what if have sample issues?

## Engineering Approach

- can get "optimal duopoly" structure with modest competition benefits, when traditional approach would suggest monopoly.
- focus on optimal design
  - can be much different than the design actually implemented
- With long-lived assets, history becomes important.