

1. (10 pts) There are obviously advantages and disadvantages to making decisions within a firm rather than relying upon the marketplace. BRIEFLY describe the characteristics of transactions that are better suited for the integrated firm and those that are better suited for the market.

[Note for #2: This factoid may precede you, but K-tel was the giant of pre-packaged mix albums and tapes from the mid-'70s to the mid-'80s. It briefly enjoyed a renaissance during the late 1990s dot-com mania, as K-tel claimed it would allow online consumers to build legal recordings from their massive archives. Alas for the one-hit wonders that rely critically upon such outlets, this was one more great idea of the late '90s that was not to be. Fortunately, iTunes persists.]

2. (30 pts) K-tel Records makes disco (y), but it can't spin its magical music out of thin air. Its inputs are vapid lyrics (L) and good karaoke beats (K), and they come together in the Cobb-Douglas production function $y = 4L^{1/3}K^{1/2}$. The factor price of lyrics is denoted w , and the factor price for karaoke-ness is denoted r .

a) Separately calculate the marginal disco product of lyrics (dy/dL) and karaoke-ness (dy/dK).

b) Derive K-tel's cost-function (i.e., find an expression of K-tel's minimized costs that is in terms of y , r , and w).

c) Show that doubling both factor prices always leads to doubling costs.

d) Under what ranges of production (if any) does K-tel enjoy economies of scale?

3. (30 pts) Inspired by Trump's "The Apprentice" (the earlier, non-celebrity version), some economists with *way* too much time on their hands have estimated the cost-functions of three different states regarding their production of overly confident MBAs (x) and annoying lawyers (y). Those cost-functions (all factor prices have been substituted out) are

$$\begin{array}{ll} \text{Texas:} & C = 50 + 4x + 6y \\ \text{Ohio:} & C = 2x + 3y + y^2 \\ \text{Missouri:} & C = 60 + 3x^2 + 2xy + 5y^2 \end{array}$$

a) What are the expressions of marginal cost for each state for each output? Which state has the lowest marginal cost of producing lawyers?

b) Calculate each state's multi-product measure of scale economies. Under what ranges of production do increasing returns to scale exist for each state?

c) Calculate each state's measure of scope economies. Under what ranges of production do scope economies exist for each state?

d) What are the sources of these economies (or diseconomies) of scale and scope (i.e., what characteristics of the cost functions lead to your conclusions)?