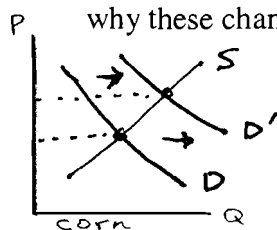


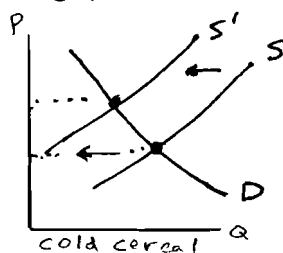
1. (5 pts.) How does a market system answer the basic economic question: what goods will be produced and in what amounts?

Consumers vote with their dollars - consumer sovereignty. Profit-driven producers then produce products consumers want to buy.

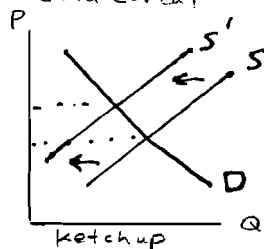
2. (10 pts.) Recent developments in the market for corn are having ripple effects in other sectors of the economy. The prices of products such as Wheaties (a wheat-based cold breakfast cereal) and Cheerios (an oat-based cold breakfast cereal) are expected to rise. Consumption of ketchup is expected to fall. Use supply and demand analysis to explain why these changes are likely to occur.



ethanol subsidies cause demand for corn to increase, pushing corn prices upward.



Farmers plant more corn and less wheat and oats, pushing their prices upward. Key inputs in cereal production (corn, wheat, oats) all are more costly, so supply of cold cereal shifts left.



corn syrup is used to sweeten ketchup. Supply of ketchup shifts left due to increase in price of an input.

3. (5 pts.) What are some of the perverse side effects of rent controls on apartments in Mumbai, India?

Landlords have no incentive to maintain their properties, and sometimes even abandon them. Non rent-control apartments are in short supply.

4. (10 pts.) In an attempt to increase attendance, Cedar Point amusement park decides to lower the price of admission from \$45 to \$40. In the year following the price reduction, attendance increases from 3.1 million to 3.4 million visitors. You are asked by management to calculate own-price elasticity of demand, and then to advise them on whether this was a good idea. P.S., they would like for you to show your calculations.

$$\epsilon_{x, p_x} = \frac{\% \Delta Q_x}{\% \Delta P_x} = \frac{\frac{.3}{3.1 + 3.4}}{\frac{5}{45 + 40}} = \frac{\frac{3}{65}}{\frac{5}{85}} = .785$$

$\epsilon_{x, p_x} < 1$ , so demand is inelastic.

Lowering price causes total revenue to fall.  
 Since output rises, total costs will increase.

Profits must decline, so BAD IDEA.

5. (5 pts.) Recently the state of New Mexico raised the tax on beer, leading to a ten-percent increase in the price of beer. Beer sales fell by around five percent statewide. In the adjoining state of Texas, the managers of Lone Star Brewing Company observed the experience of the state of New Mexico and decided to raise the price of their premium Pearl beer by five percent. They experienced a ten percent drop in quantity sold. Perplexed, they turn to you for an explanation for this seeming anomaly.

all beer: broadly defined, so few substitutes  
 and less elastic demand.

Pearl Premium Beer: narrowly defined, so  
 many good, close substitutes and  
 more elastic demand.

No surprise here.

6. (15 pts.) We own and operate a Johnny Jim's sandwich shop. After some experimentation with our current configuration of the restaurant, we find that labor and output vary in the following way:

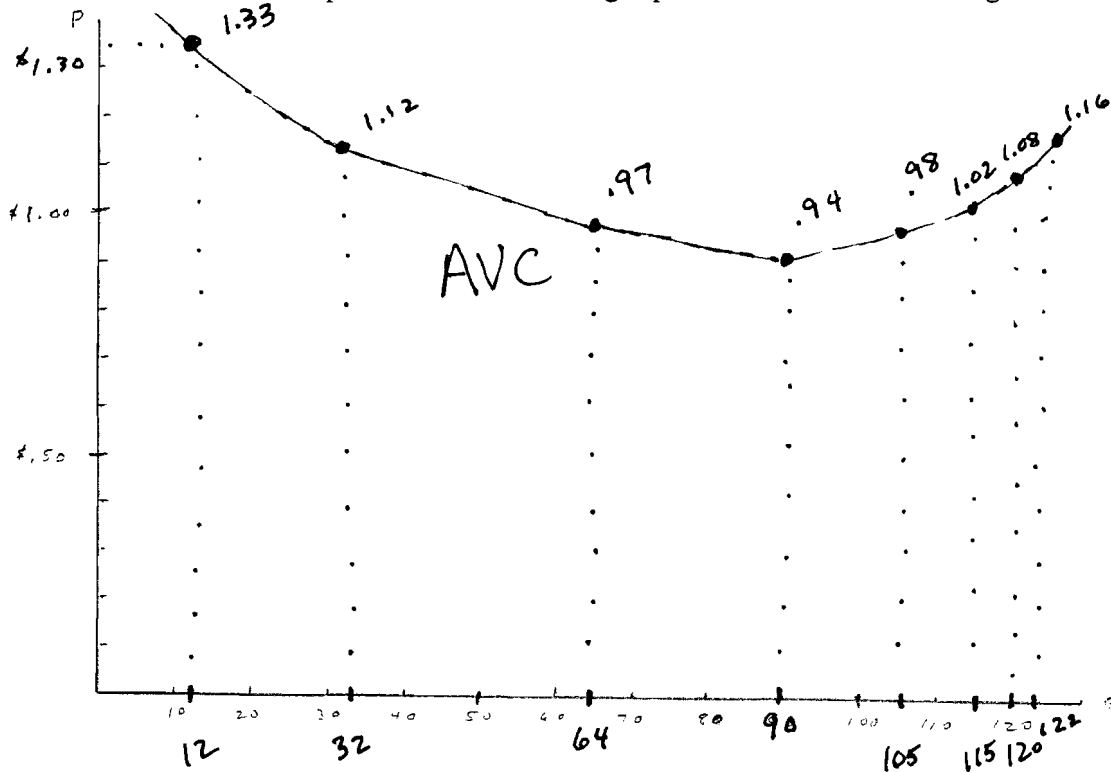
Labor (person-hours)	0	1	2	3	4	5	6	7	8
Output (meals per hour)	0	12	32	64	90	105	115	120	122

(a) Use the concept of marginal product to explain at what point diminishing returns set in.

$$MP_L = \frac{\Delta Q}{\Delta L} = \begin{matrix} \checkmark & \checkmark & \checkmark & \checkmark & \checkmark & \checkmark & \checkmark & \checkmark \\ 12 & 20 & 32 & 26 & 15 & 10 & 5 & 2 \end{matrix}$$

*Diminishing marginal returns set in with the addition of a fourth worker.*

(b) Total compensation costs (wages plus benefits) per worker are \$10 per hour. The only other variable costs besides labor are the sandwich ingredients, which cost a constant \$.50 per sandwich. Plot eight points on our firm's average variable cost curve.



L	1	2	3	4	5	6	7	8
Q	12	32	64	90	105	115	120	122
TVC*	\$16	36	62	85	102.5	117.5	130	141
AVC	\$1.33	1.125	.97	.94	.98	1.02	1.08	1.16

$$TVC = L * 10 + .50 * Q$$

7. (5 pts.) The short-run average total cost curve is U-shaped. Explain the economic intuition behind this shape.

When the SRATC curve is declining (because AFC is declining), "spreading overhead expenses" is the dominant effect.

When the SRATC curve is increasing (because AVC is increasing), "diminishing returns" is the dominant effect.

8. (10 pts.) Your instructor's younger sister Betsy owns and operates a sandwich shop in Fort Walton Beach, FL. The income statement for her business shows annual revenues of \$150,000. Costs include wages for hourly employees (\$35,000), utilities (\$15,000), food supplies (\$40,000), taxes (\$5,000), advertising (\$5,000), and insurance (\$5,000). Betsy quit her job managing a similar business where she earned \$25,000 per year, but she pays herself no salary in this business. She and her husband own the strip mall where her sandwich shop is located, and the space occupied by her shop previously rented for \$1,000 per month. They have \$40,000 invested in the business, which they could recover if they liquidated. They ask you to help them figure out the "rate of return" they are earning on their \$40,000 that they have invested in the sandwich shop. Evaluate the economic profitability of their business.

$$\text{Tot Rev} = \$150,000$$

$$\text{Tot Explicit Costs} = 35 + 15 + 40 + 5 + 5 = \$105,000$$

$$\text{Net accounting revenue} = \$45,000$$

$$\text{Implicit Costs} = \begin{array}{l} \$25,000 \text{ in foregone wages} \\ \$12,000 \text{ in foregone rent} \end{array}$$

plus foregone interest on the \$40,000 they have tied up in the business.

Currently they are earning \$8,000. ( $= 45 - 25 - 12$ ) on their \$40,000 investment each year, which is a 20% return. If a normal return is 7-8%, then they are earning positive economic profit (an above-normal return).

9. (5 pts.) The oil company that you work for decides to vertically integrate into shipping, and asks you to evaluate the per barrel costs of transporting crude oil by tanker ships. You consider building two small ships or one large ship. What factors might cause average costs to decline as the size (scale) of the ship increases?

- engineering relationships - rule of  $2/3$
- set-up costs - captain and crew

10. (10 pts.) A firm produces two products, X and Y. The production technology displays the following costs, where  $C(i, j)$  represents the cost of producing  $i$  units of X and  $j$  units of Y:

$$\begin{array}{ll} C(0,50) = 100 & \leftarrow \\ C(0,100) = 210 & \leftarrow \\ C(5,50) = 240 & \\ C(5,0) = 150 & \leftarrow \\ C(10,0) = 320 & \leftarrow \\ C(10,100) = 500 & \end{array}$$

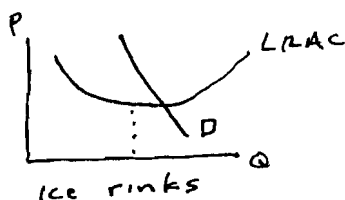
Does this production technology display economies of scale? Of scope? Explain your answers.

- double the output of X from 5 to 10, TC more than doubles from 150 to 320. Same is true for Y. So, diseconomies of scale.

- cost of producing X and Y together,  $C(5,50) = 240$ , is less than the sum of the costs of producing each of them separately,  $C(5,0) + C(0,50) = 150 + 100 = 250$ . So economies of scope.

11. (5 pts.) Why are there so many fast-food restaurants in Lexington, yet only one ice-skating rink? Illustrate your answer with diagrams.

MEIS is small relative to market demand for fast-food restaurants, but large for ice skating rinks:



12. (10 pts.) Consider each of the following situations, and explain whether you would recommend "make" or "buy" to the parties involved, i.e. evaluate the sort of vertical relationship you think might work best.

(a) An electric utility contemplates building a power plant right beside a very thick coal seam located in the mountains of eastern Kentucky.

The power plant is a site-specific asset. Building it next to the coal mine leaves the utility vulnerable to ex post hold-up. Instead of relying on spot-market purchases from an independently owned coal mine, the electric utility should either vertically integrate or negotiate ex ante a long-term contract to buy the coal.

(b) A construction company that has occasional needs for dump trucks to haul various things contemplates buying its own fleet of trucks.

Markets excel at aggregating uncorrelated demands. Buy trucking services in the market from a trucking company that can keep its trucks fully employed by renting them to multiple users like ~~the~~ this construction company.

13. (5 pts.) Toyota has organized workers into teams to carry out the production of cars in its factories. This approach has been very successful for Toyota. When Levi's tried to organize its workers into teams to produce garments like blue jeans, however, it met considerable resistance from its workers and decreases in productivity. Why didn't this approach work at Levi's?

The production process at Levi's lends itself well to a piece-rate compensation system. The team approach broke the tight connection between productivity and pay. Shirking became a problem.