

BADM 505 – FIRM ANALYSIS AND STRATEGY

PROBLEM SET TWO QUESTIONS

1. You are considering opening a restaurant in the District of Columbia that specializes in Canadian cuisine. You know of a building that you could buy that would cost \$100,000. It would require \$30,000 in improvements, however, to make it usable. Some of the improvements would be useful only to a restaurant selling Canadian cuisine. You have already paid \$5,000 for market research that indicates a strong demand for Canadian cuisine. You have also already paid a consultant \$10,000 to help with a cost analysis. The cost and demand research indicate that you could more than cover expenses for one year, but the Canadian cuisine craze will then die out and he will have to sell the building. Since there are no other entrepreneurs with the skills to run Canadian-cuisine restaurants, the building can be sold for \$123,000 maximum, even after the improvements. You would also have to pay a real estate agent \$10,000 in order to sell the building.

What is the minimum total profit that you would have to earn in one year of business to justify proceeding with the restaurant?

Solution

BUY: -100,000

IMPROVEMENTS: -30,000 MARKET RESEARCH: -5,000 (paid) CONSULTANT: -10,000 (paid) BUILDING: 123,000

REAL STATE: -10,000

SUMATION OF ALL GIVES: -\$17,000; SO TO BE PROFITABLE WE SHOULD MAKE MORE THAN \$17,000

2. Eating gumbo and shrimp Po' Boys one evening, you receive a phone call from a representative of Boucher Rentals Inc., a vacation rental property firm located in the Bayou of Louisiana. The representative, Vicki Vallencourt, indicates that your name was drawn in a recent lottery held by the vacation rental property firm. You will receive a cash prize, but in order to claim your prize, however you must visit the resort the following Friday. If you visit Boucher Rentals Inc., you will miss a full day (12 hours) of work from your job shrimping, which pays a wage rate of \$25 per hour, and pay for the gas to drive to Boucher Rentals Inc. and back (\$20 for the roundtrip). Because you will not go to work that day you will not have to pay the \$5 for gas normally required to drive to and from your regular job shrimping. You will also not have to pay to park your car, for which you have a monthly parking pass that costs \$50 per month regardless of days parked. Assume that you have no other costs to consider.

What is the minimum prize level you would need to receive in order to justify visiting Boucher Rentals Inc.?

Solution –

MISSING A DAY: $12 \times 25 = -300$ GAS ROUNDTRIP: -20

GAS DRIVE: 5 (saving) PARKING: 50 (paid)

MINIMUM PRIZE: $-300 - 20 + 5 = -315$; IT SHOULD BE ABOVE 315

3. Spinal Tap, Inc. manufactures amplifiers that “go to 11.” Different quantities and total costs for Spinal Tap, Inc. are summarized below.

Q	FC	$VC(Q)$	$TC(Q)$	$ATC(Q)$	$MC(Q)$
0	1000	0	1,000	0	0
1	1000	1000	2,000	2000	1000
2	1000	1500	2,500	1250	500
3	1000	3000	4,000	1333	1500
4	1000	5000	6,000	1500	2000
5	1000	9000	10,000	2000	4000
6	1000	14000	15,000	2500	5000

- Fill in the missing information in the table.
- Over what range of quantities, if any, are there economies of scale?
(0-2)
- Over what range of quantities, if any, are there diseconomies of scale?
(3-6)

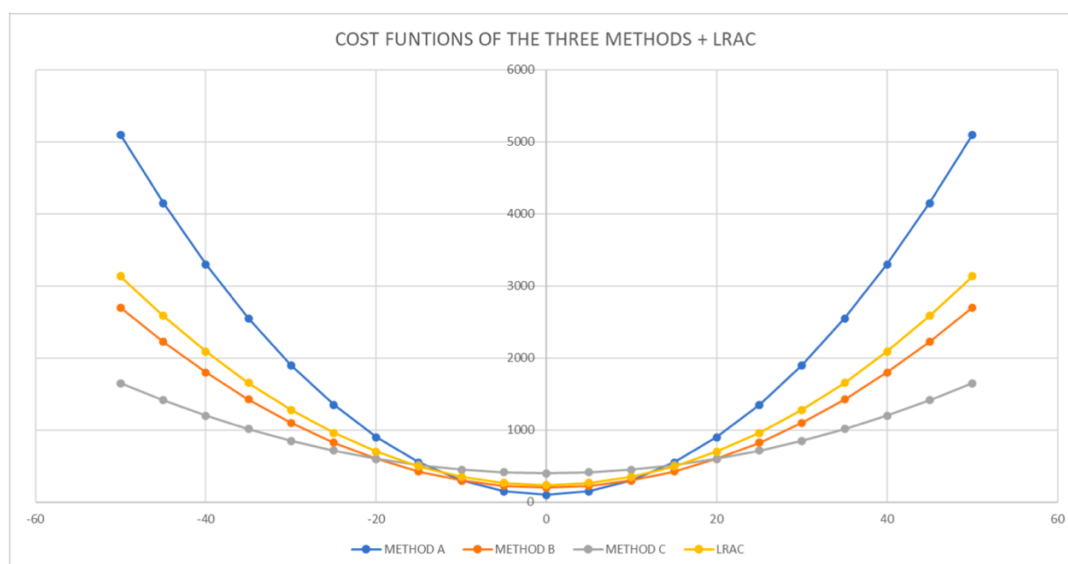
4. You are considering entering the market for breeding weasels. There are only three methods available for breeding weasels. Each breeding method incurs a different level of fixed costs (e.g., habitat, size of enclosure) and variable costs (e.g., food) associated with it, as indicated in the table below. You have no reason to doubt, question or refute this information.

METHOD	TOTAL COST
A	$TC(q) = 100 + 2q^2$
B	$TC(q) = 200 + q^2$
C	$TC(q) = 400 + \frac{1}{2}q^2$

Determine the Long Run Average Cost (LRAC) function, according to the quantity of weasels bred.

Solution -

The combination of the three may be the LRAC: $AVERAGE(A,B,C) \Rightarrow TC(q) = 233.33 + 1.16q^2$



SIMULATION DATA:

METHOD	A	B	C	LRAC
q \ TC(q)	$100+2q^2$	$200+q^2$	$400+1/2q^2$	$233.33+1.16q^2$
-50	5100	2700	1650	3133.33
-45	4150	2225	1412.5	2582.33
-40	3300	1800	1200	2089.33
-35	2550	1425	1012.5	1654.33
-30	1900	1100	850	1277.33
-25	1350	825	712.5	958.33
-20	900	600	600	697.33
-15	550	425	512.5	494.33
-10	300	300	450	349.33
-5	150	225	412.5	262.33
0	100	200	400	233.33
5	150	225	412.5	262.33
10	300	300	450	349.33
15	550	425	512.5	494.33
20	900	600	600	697.33
25	1350	825	712.5	958.33
30	1900	1100	850	1277.33
35	2550	1425	1012.5	1654.33
40	3300	1800	1200	2089.33
45	4150	2225	1412.5	2582.33
50	5100	2700	1650	3133.33

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

$TC(0,50)$	= 100	$TC(5,0)$	= 150
$TC(0,100)$	= 210	$TC(10,0)$	= 320
$TC(5,50)$	= 240	$TC(10,100)$	= 500

- a. Does this production technology display economies of scale?

- NO , because average total cost over the output range seems to decline.

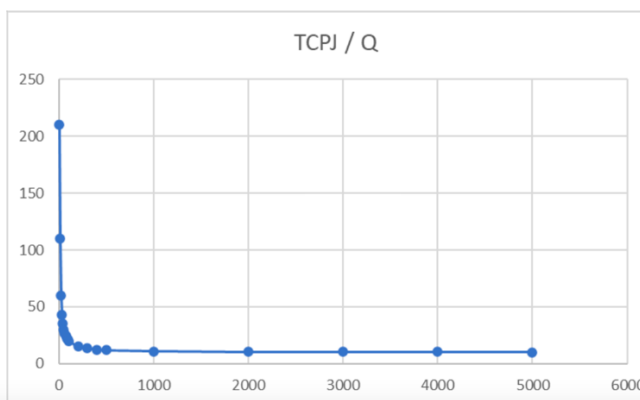
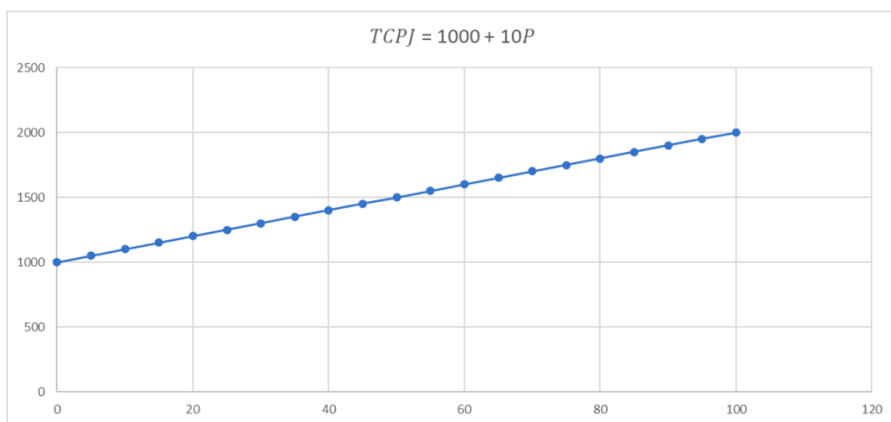
- b. Does this production technology display economies of scope?

- Yes, this production technology displays economies of scope because $TC(5,50) < TC(0,50) + TC(5,0)$ & $TC(10,100) < TC(10,0) + TC(0,100)$

6. PB&J Inc. has two separate subsidiaries: P-IT produces peanut butter and J-IT produces jelly. Neither subsidiary sells output to the external market. Instead, PB&J Inc. uses the output from each subsidiary to produce peanut butter & jelly “kits” that it sells in the retail market. Although these kits come in different sizes, each contains peanut butter and jelly in the “proper” ratio of 1:1 (i.e., one oz. of peanut butter for one oz. of jelly). P-IT’s cost function for peanut butter production is: $TC_P = 150 + 80P$, where P represents oz. of peanut butter. J-IT’s cost function for jelly production is: $TC_J = 50 + 30J$, where J represents oz. of jelly. An in-house research scientist has come up with a new process that produces one ounce of jelly as a byproduct of one ounce of peanut butter produced. The cost function for the new production process is: $TC_{PJ} = 1000 + 10P$.

- a. Find a level of output (P) for which production exhibits economies of scope.

$$TC_{PJ} = 1000 + 10P$$



Q	$TC_{PJ} = 1000 + 10P$	TC_{PJ} / Q
0	1000	N/A
5	1050	210
10	1100	110
20	1200	60
30	1300	43.3333
40	1400	35
50	1500	30
60	1600	26.6667
70	1700	24.2857
80	1800	22.5
90	1900	21.1111
100	2000	20
200	3000	15
300	4000	13.3333
400	5000	12.5
500	6000	12
1000	11000	11
2000	21000	10.5
3000	31000	10.3333
4000	41000	10.25
5000	51000	10.2

Solution –

- a) From the curve $TCPJ/Q$, it is observed that from 0 to 1000 the average cost price reduces substantially hence this could be the level of output for the same.
- b. Find a level of output (P) for which production exhibits diseconomies of scope.

Solution

It looks like economies may be found from 1000 on as the price per unit may not go below 10 as the average cost per unit remains the same.