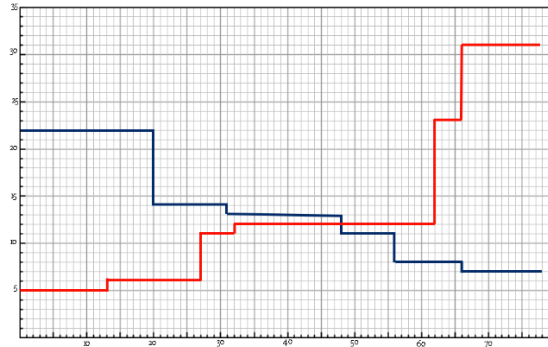


COMM 220 – J
ANALYSIS OF MARKETS
Practice Midterm 2017

PART 1 – TAXES AND SUBSIDIES

B2	20	22	S1	13	5
B6	11	14	S4	14	6
B3	17	13	S6	5	11
B1	8	11	S5	30	12
B5	10	8	S2	4	23
B4	12	7	S3	12	31



Equilibrium Quantity = 48
Equilibrium Price = \$12.50

1. What is the equilibrium price?

- a. ≤ 5 b. < 11 **c. < 13** d. < 15 e. ≥ 16

The last trade occurs between B3 (\$13) and S5 (\$12). The midpoint is \$12.50.

2. What is the equilibrium quantity?

- a. ≤ 22 b. < 33 c. < 41 **d. < 49** e. ≥ 50

B2 will buy 13 units from S1 and 7 units from S4. B6 will buy 7 units from S4 and 4 units from S6. B3 will buy 1 unit from S6 and 16 units from S5. Total = 48 units traded.

3. Now assume that a \$2 per unit tax is added, what is the new equilibrium quantity and price once the tax takes effect?

- a. (32, \$13) b. (27, \$11) c. (31, \$13) d. (48, \$13)

With a \$2 tax, S5 can no longer find a buyer. B2 will buy 13 units from S1 and 7 units from S4. B6 will buy 7 units from S4 and 4 units from S6. B3 will buy 1 unit from S6. Total = 32 units. Last trade occurs at \$13 on buyer and seller side so midpoint = \$13.

4. How much revenue will the tax raise for the government?

- a. $\leq \$30$ b. $< \$39$ c. $< \$63$ **d. $< \$69$** e. $\geq \$70$

Tax revenue = # of units traded x tax amount. 32 units were traded each carrying a \$2 tax. $32 \times \$2 = 64$.

5. What would be the new equilibrium quantity and price if it had been a \$2 subsidy instead?

- a. (62, \$10.50) b. (56, \$10.50) c. (56, \$11) d. (62, \$10)

With a subsidy, now B1 and S5 are in the game. B2 will buy 13 units from S1 and 7 units from S4. B6 will buy 7 units from S4 and 4 units from S6. B3 will buy 1 unit from S6 and 16 units from S5. B1 will buy 8 units from S5. Total = 56 units. Last trade occurs between B1 (\$11) and S5 (\$10). Midpoint = \$10.50

6. How much would it cost the government to subsidize this equilibrium (how much would the subsidy end up costing them if they were footing the bill)?

- a. $\leq \$30$ b. $< \$39$ c. $< \$63$ d. $< \$69$ e. $\geq \$70$

With 56 units traded at a subsidy cost of \$2 per unit, the subsidy costs the government $56 \times \$2 = \112 .

7. How would the deadweight loss be affected if the tax were \$1 per unit (compared to \$2)?

- a. It would be larger
b. There would be no difference
c. Uncertain
d. It would be smaller
e. It would be negative

The greater the intervention (tax or subsidy), the greater the deadweight loss. In the absence of intervention, the equilibrium quantity and price reflect exactly how many items should change hands and the exact market price. Once there is a tax or subsidy, the equilibrium shifts away from what it would be in perfect competition and deadweight loss is created.

8. Is there a deadweight loss in the case of the subsidy?

- a. Yes b. No c. Unable to say

With a subsidy, more units are being produced and traded than there should be at a lower price. As soon as there is outside intervention, there is a deadweight loss.

PART 2 – GAME THEORY

Given the following scenario, answer questions 9-13.

Lucy and Ricky have started competing businesses and must determine how to price their product. They can each choose to set a “High” price, or a “Low” price. The values in the table are their expected returns given the chosen strategies.

		RICKY	
		High	Low
LUCY	High	\$50,000, \$25,000	\$25,000, \$50,000
	Low	\$25,000, \$50,000	\$50,000, \$25,000

9. Is there a dominant strategy?

- a. Yes **b. No** c. Maybe d. I don't know e. Can you repeat the question?

10. In a Nash Equilibrium...

- a. Each player's choice is optimal given the other's choice however there is an incentive to deviate from a choice given the other player's choice
b. Neither player considers the other's choice
c. Each player's choice is optimal given the other's choice and there is no incentive to deviate from a choice given the other player's choice
d. Each player takes into account the other's choice but there are no dominant strategies

11. Is there a Nash Equilibrium in the previous example?

- a. Yes **b. No** c. I have no idea d. Where am I?

12. Who will end up with a greater income?

- a. Lucy
b. Ricky
c. Uncertain
d. They will have the same income

Let's say both choose “High”. Rick will be incentivized to change to “Low” which will lead Lucy to change to “Low” which will lead Ricky to move back to “High” causing Lucy to return to “High” and so on and so forth. Without a Nash equilibrium, both Lucy and Ricky can make the other worse off by changing their strategy and will therefore do so. We therefore cannot say how this situation will play out.

Use the following diagrams to answer questions 13-15

		RICKY	
		Left	Right
LUCY	T	(5,7)	(3,6)
	B	(6,5)	(2,6)

		FRED	
		Left	Right
ETHEL	T	(8,7)	(6,6)
	B	(5,6)	(7,5)

13. How many Nash Equilibriums exist in the scenario on the left (between Lucy and Ricky)?

- a. 1 b. 2 c. 3 d. 4 e. none

14. Does a dominant strategy exist in either scenario?

- a. Yes, between Ricky and Lucy
b. Yes, between Fred and Ethel
c. Yes, in both scenarios
d. No dominant strategy exists

No dominant strategy exists between Ricky and Lucy. Ethel does not have a dominant strategy. Only Fred will have a dominant strategy (always choose left).

15. In the scenario on the right (between Fred and Ethel), what would happen if Fred chose left and Ethel chose top (T)?

- a. Ethel would change her choice to bottom (B)
b. Neither would change their choice given the choice of the other - this is a Nash Equilibrium
c. Fred would change his choice to right
d. Both Fred and Ethel would change their choices
-

PART 3 – BUBBLES AND CRASHES

Answer questions 16-19 using your knowledge and understanding of Professor Vernon Smith's experiments on *Bubbles and Crashes*. Note that at the end of each period, a coin toss determined whether the stock paid a dividend of \$15 or \$25, and all participants knew this.

16. What should have been the equilibrium price of the stock before the payment of the first dividend if the stock was expected to pay a total of 10 dividends?

- a. ≤ 151 b. < 170 c. < 185 **d. < 201** e. ≥ 202

With 10 dividend payments of either \$15 or \$25, the equilibrium price should be $[(50\% \times 15) + (50\% \times \$25)] \times 10 = 200$.

17. Suppose that in addition to a spot market, a forward market is opened in period 7 for delivery of the stock in period 9. What is the equilibrium forward price of this contract?

- a. ≤ 15 b. < 21 **c. < 41** d. < 51 e. ≥ 52

If the stock is delivered in period 9, it will on receive 2 dividend payments (period 9 and period 10). The equilibrium price should be $[(50\% \times 15) + (50\% \times \$25)] \times 2 = 40$.

18. If you believed that all the coin flips would land on heads meaning that the dividend would always be \$25, what is the most you, as a rational investor, would pay for the stock just before the start of period 5?

- a. ≤ 135 b. < 140 **c. < 155** d. < 160 e. ≥ 161

If all dividends will be \$25 then you will get \$25 in periods 5,6,7,8,9, and 10. $6 \times \$25 = \150 .

19. Suppose now that the stock has been steadily increasing in each period and is now trading at \$196 in period 5. What would you do?

- a. Hold the stock because it is undervalued and will surely increase.
b. Hold the stock because it reflects the market price and therefore the fundamental value.
c. Sell the stock because it has become overvalued due partly to the herding affect.
d. Sell the stock because you believe that it has reached a plateau (won't increase or decrease)

\$196 is more than the \$150 calculated in Question 18. It is clear that the stock is overvalued as no matter what dividends are paid (\$15 or \$25), you still won't receive enough to cover a price tag of \$196.

PART 4 – RISK

You are looking to expand your stock portfolio and have narrowed your search down to three stocks; Facebook (FB), Apple (AAPL), and Walmart (WMT). The following table provides the returns of each stock for the next year (you have a 1 year investment horizon). There is a 60% chance of a boom and a 40% chance of a recession. Use the spread in returns to estimate standard deviation and use the following table to answer questions 20-23.

Stock	Return		Expected Payout	Spread
	Boom (60% chance)	Recession (40% chance)		
Facebook (FB)	\$75,000	-\$10,000	\$41,000	\$85,000
Apple (AAPL)	\$31,000	-\$6,500	\$16,000	\$37,500
Walmart (WMT)	-\$20,000	\$70,000	\$16,000	\$90,000

21. Which stock would you choose if you were risk neutral and could only choose one?

- a. FB
- b. AAPL
- c. WMT
- d. Either FB or AAPL
- e. Either AAPL or WMT

Risk Neutral investors only care about returns and do not take risk into account. Facebook has the highest expected payout.

22. Which stock would you choose if you were risk averse and could only choose one?

- a. FB
- b. AAPL
- c. WMT
- d. Either FB or AAPL
- e. Either AAPL or WMT

If you were risk averse, you would need to be compensated for taking on risk. Between Apple and Walmart, you would choose Apple as Walmart does not offer more return for the increased risk. However, the decision between Facebook and Apple is not so simple. Facebook has greater risk but also greater expected returns. Therefore, the choice will depend on the investors degree of risk aversion.

23. Now suppose you could choose two stocks to add to your portfolio with the goal of minimizing risk. Is there one stock that everyone would choose in their portfolio?

- a. FB
- b. AAPL
- c. WMT
- d. Golly Gee
- e. Gee Whiz

Even though Walmart has a low return and high risk, it is uncorrelated with the other two stocks. Although it will lower your returns during booms, it will protect you during a recession. By owning both Walmart and one of the other stocks, you will not lose money, regardless of the economic climate.

24. Strategy A has an expected value of 10 and a standard deviation of 3. Strategy B has an expected value of 10 and a standard deviation of 5. Strategy C has an expected value of 15 and a standard deviation of 10. Which one of the following statements is true?

- a. A risk averse decision maker will always prefer A to B, but may prefer C to A.
- b. A risk neutral decision maker will always prefer C to A or B.
- c. A risk seeking decision maker will always prefer C to A or B.
- d. All of the above are correct.

PART 4 – ENDOWMENT

The total economy is composed of two goods: slices of pizza and bowls of pasta. You have no income but a rich uncle of yours has recently endowed you with 20 slices of pizza and 10 bowls of pasta (how generous!). Let pizza = x and pasta = y.

25. If the current market price is \$4 for a slice of pizza and \$10 for a bowl of pasta, what is the price ratio?

- a. ≤ 0.10
- b. < 0.50
- c. < 0.70
- d. < 0.90
- e. ≥ 0.91

Price ratio: $p_x/p_y = 4/10 = 0.40$

26. How wealthy are you?

- a. ≤ 160
- b. ≤ 170
- c. ≤ 180
- d. ≤ 190
- e. ≥ 191

$(20 \times \$4) + (10 \times \$10) = \$180$

27. Would you be better off if the price of a slice of pizza increased by \$2 while the price of a bowl of pasta decreased by \$3?

- a. Yes
- b. No
- c. Uncertain
- d. Neither better off nor worse off

We cannot say without knowing your preferences!

28. Would you be better off if all prices were 6% lower?

- a. Yes
- b. No
- c. Uncertain
- d. Neither better off nor worse off

The cost of goods decreases but so does the money you are endowed with. Therefore, there is no effect of this change.

29. If the prices were actually \$8 per slice of pizza and \$9 per bowl of pasta, you would be wealthiest if your endowment was...

- a. 5 slices of pizza and 10 bowls of pasta
- b. 6 slices of pizza and 19 bowls of pasta**
- c. 17 slices of pizza and 8 bowls of pasta
- d. 3 slices of pizza and 20 bowls of pasta

Power through! a - $(5*8)+(10*9) = \$130$. b - $(6*8)+(19*9) = \$219$. c - $(17*8)+(8*9) = \$208$. d - $(3*8)+(20*9) = \$204$

PART 5 – MISC.

30. You have agreed to purchase a piece of real estate today for \$15,000. You expected to hold the property for eight years and then sell it. You expect the property to increase in value 15% per year, compounded annually. For how much should you be able to sell the property in 8 years?

- a. $\leq \$44,000$
- b. $< \$46,000$**
- c. $< \$47,000$
- d. $< \$50,000$

$\$45,885.34$

31. What will be the value of \$5,500 in 4 years if the yearly interest rate of 11% is compounded quarterly?

- a. $\leq \$8,000$
- b. $< \$8,300$
- c. $< \$8,600$**
- d. $< \$9,000$

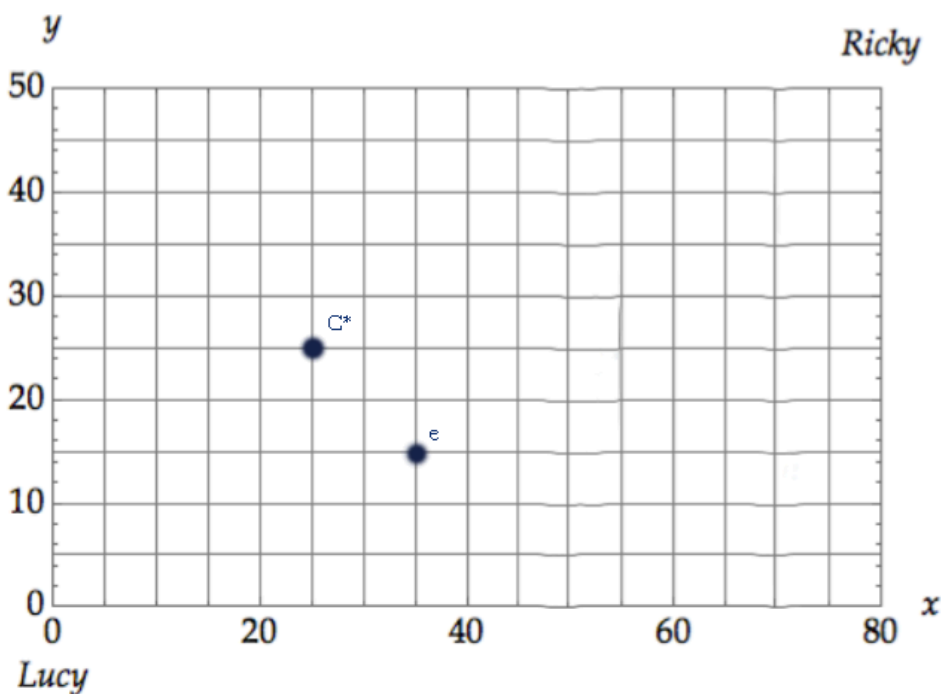
$\$8,489.30$

32. Assume a property is priced at \$5,000 and has the following income stream (year 1, \$1,000; year 2, -\$2,000; year 3, \$3,000; and year 4, \$3,000). Would an investor with a required rate of return of 15 percent be wise to invest at the current price?

- a. Yes because the NPV of the project is \$2,355.91
 - b. Yes because the NPV of the project is \$1,954.91
 - c. No because the NPV of the project is -\$2,355.91
 - d. No because the NPV of the project is -\$1,954.91**
-

PART 6 – PARETO OPTIMALITY

Here is an Edgeworth Box for a pure exchange economy, showing the endowment, $e = (35,15)$, the Pareto Optimum, $C^* = (25,25)$, but not the indifference curves.



33. What is the equilibrium price ratio?

- a. 1/2 **b. 1** c. 2 d. -1/2 e. -1

$$|(Y2-Y1)/(X2-X1)| = |(25-15)/(25-35)| = 1$$

34. How did Ricky and Lucy reach C^* ?

- a. Ricky sold 10 units of x in exchange for 10 units of y
 b. Ricky sold 5 units of x in exchange for 5 units of y
 c. Ricky sold 10 units of x in exchange for 5 units of y
d. Ricky sold 10 units of y in exchange for 10 units of x
 e. Ricky sold 5 units of y in exchange for 10 units of x

Lucy moves from $x=35$ to $x=25$ and from $y=15$ to $y=25$.

34. If money took the place of barter and if the price of y happened to be \$40 in equilibrium, then the price of x would have to be...

- a. $\leq \$20$ b. $< \$35$ **c. $< \$45$** d. $< \$60$

The price of x would be \$40 because of the price ratio of 1.

35. What can you say about marginal rates of substitution at e?

- a. Ricky's MRS is bigger than Lucy's
- b. Lucy's MRS is bigger than Ricky's
- c. Both Ricky and Lucy have an MRS equal to 1
- d. Both Ricky and Lucy have an MRS equal to the price ratio
- e. Both C and D are correct

The MRS is $|(Y_2 - Y_1)/(X_2 - X_1)|$. Therefore, the more "Y" are willing to trade for each "X", the bigger your MRS. At e, Lucy has less "Y" than she wants and therefore, will have a MRS lower than 1. Ricky has too much "Y" and wants "X" so he will trade more "Y" for 1 "X" and will therefore have a larger MRS.

36. What can you say about marginal rates of substitution at C*?

- a. Ricky's MRS is bigger than Lucy's
- b. Lucy's MRS is bigger than Ricky's
- c. Both Ricky and Lucy have an MRS equal to 1
- d. Both Ricky and Lucy have an MRS equal to the price ratio
- e. Both C and D are correct

At C*, MRS = price ratio = 1

END