Benefit-Cost Analysis **Exam 1** **10-9-2020**

NAME:

Instructions

i. Indicate your name above.
ii. Answer all six questions in the space provided.
iii. Show and explain your work.
iv. Be neat and concise.
v. List and explain any assumptions you make.
vi. You may use any resources at your disposal other than speaking or otherwise communicating with anyone else.
vii. Keep your camera, microphone, and speakers on for proctoring and for test related communications.
viii. Upload an electronic copy of your work to canvas by 3:00 PM.

1) What is the difference between Pareto efficiency and Hicks-Kaldor efficiency, and why is it relevant to benefit cost analysis?

A pareto efficient change helps some and hurts none. A change with massive benefits to most would not be pareto efficient if there were small net costs to a few. A Hicks-Kaldor efficient change simply is one for which total benefits exceed total costs. That means winners could compensate losers, even though that rarely actually happens. Thus, the Benefit-Cost test reflects H-K efficiency, not Pareto Efficiency, which, if required, would prevent almost all change from the status quo.

2) Why are benefit cost ratios inappropriate for evaluating alternative projects?

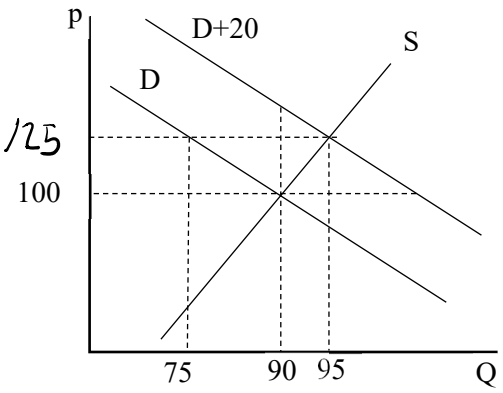
There are two main reasons.

1) They may be manipulated by choosing whether a given effect is counted as a negative benefit or a positive cost (or a positive benefit versus as a negative cost).
2) A project with a low ratio of benefits to costs may still have a far larger net benefit.

3) Suppose your company is preparing a benefit-cost analysis to use to lobby the local government for a policy you want passed. Why would you want to know if the relevant decision makers are guardians or spenders?

If they are a spender, you would focus on benefits to their constituents when trying to convince them. On the other hand, if they were a guardian, you would focus on revenues accruing to the local government.

4) A government project purcgases 20 units in a local market. The METB is 0.2. The elasticity of demand is -2/3. Other pertinent information is summarized in the figure provided. Calculate the changes in PS, CS, GS, and SS associated with the purchase.



1) Calculate the new price.

$\%\Delta Q = -15/90 \cdot 100 = -16.7\%$

$-\frac{50}{3} = \%\Delta P \cdot (-2/3)$

$\%\Delta P = 25\%$

2) $\Delta CS = -25 \cdot 75 - \frac{1}{2} \cdot 25 \cdot 15$

$= -2062.5$

$\Delta PS = 25 \cdot 90 + 1/2 \cdot 25 \cdot 5$

$= 2312.5$

$\Delta GS = -125 \cdot 20$

$= -2500$

$\Delta SS = -2062.5 + 2312.5 - 1.2 \cdot 2500$

$= -2750$

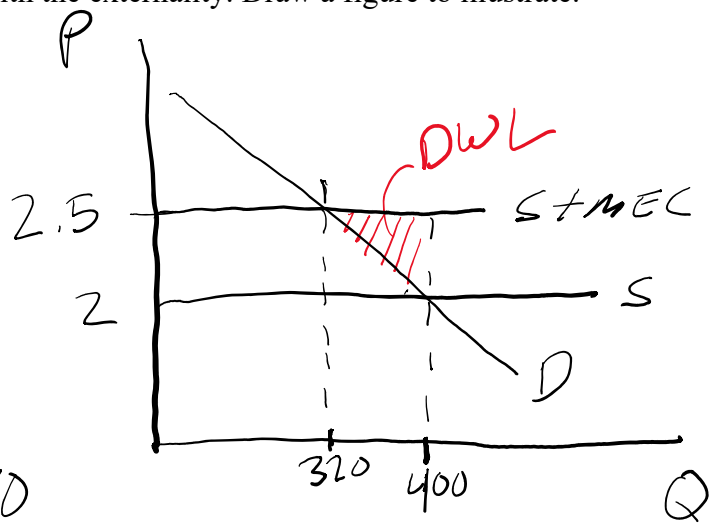
5) Suppose:
i) the price of gasoline is $2 per gallon
ii) current consumption is 400 (million) gallons per day
iii) the elasticity of demand is -0.8
iv) retail provision of gasoline may be approximated as a constant cost industry
v) there is an external cost of $0.5 per gallon of gas.
Calculate deadweight loss associated with the externality. Draw a figure to illustrate.

1) Find the efficient Quantity.

$\%\Delta P = 25\%$

$\%\Delta Q = -0.8 \cdot 25\% = -20\%$

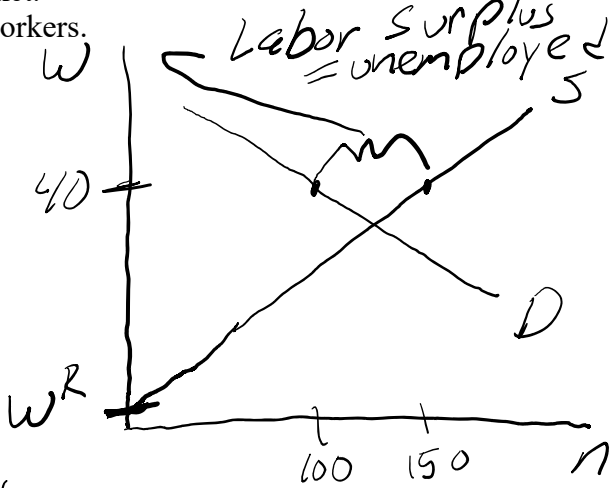
$Q_2 = 0.8 \cdot 400 = 320$



2) $DWL = \frac{1}{2} \cdot 0.5 \cdot 80$

$= \$20$ M/day

6) A local government project requires 30 workers for a year from a market in which currently 100 workers are employed, 50 are unemployed, and the annual wage is $40K. The MEBT is 0.2.
a) Draw a figure illustrating the state of the market.
b) Calculate the opportunity cost of hiring the workers.



Since unemployment is so high, the wage overestimates the opportunity cost of labor.

A reasonable guess is that the opportunity cost of the average hire is halfway between the reservation wage (w^R) and the wage. Without knowing w^R, we will use 0, based on the high social cost of continued unemployment. So the opportunity cost of the average worker hired is estimated at $20.

The net social cost of project Labor is then:

$$30 \cdot 20 + 0.2 \cdot 30 \cdot 40 = 600 + 240$$
$$= \$840K$$